

# MINOT HOUSING SUPPLY AND DEMAND ANALYSIS UPDATE

MARCH 2017





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# Section 1: Executive Summary

*City of Minot, North Dakota*





## Section 1: EXECUTIVE SUMMARY

The dramatic changes in Minot's housing market over the past six years are unprecedented. Historic floods devastated a wide swath of the city, damaging or destroying many homes and apartments followed by an influx of oil and gas companies and their employees who seemed willing to pay almost any price for housing. Rents skyrocketed, new houses and apartments were under construction everywhere, and many people and businesses struggled to remain in Minot as it became more and more expensive to do so. Although housing costs have moderated and residential construction is progressing at a more normal pace, the residual effects of the flood and the oil boom continue to impact the city's housing and many low and moderate income residents.

The 2016 Minot Housing Supply and Demand Update provides perspective on the current housing market and the primary supply-and-demand factors influencing affordable housing. An earlier housing supply and demand study, completed in October 2013, evaluated the housing impacts caused by rapid increases in population from oil and gas workers and the loss of affordable housing from the flood. In 2012, the average monthly rent for a two-bedroom apartment was \$1,313 and a three bedroom was \$1,887. By late 2012, 48 percent of Minot households could not afford the median two-bedroom rent and 70 percent couldn't afford a three-bedroom apartment.

Today Minot's housing market has changed significantly. In 2010 there were 4,141 multifamily apartments; in 2016 that number increased 77 percent to 7,375 units.<sup>1</sup> In 2010, 69 percent of Minot's total housing stock was single family residential compared to 59 percent in 2016. There has been a dramatic change in housing values. In 2010, 83 percent of single family housing was valued between \$50,000 and \$200,000. By the third quarter of 2016 only 55.8 percent of single family housing was valued below \$200,000. The reduction in the number of affordable single family homes reflects the loss of more affordable housing significantly damaged or destroyed by the flood, construction of higher value replacement homes, and new residential developments with larger, more expensive housing. Maps showing the assessed valuation of single family housing by year from 2010 to 2016 provides a geo-spatial perspective of this value transition (see Figure 3.3 through Figure 3.6).



<sup>1</sup> According to data from the City of Minot Assessor's Office, October, 2016



Another significant change is the increased vacancy rates in market rate multifamily housing. In 2012, vacancies in single family and multifamily housing were near zero. People were living in campers, RV's, and hotels hoping to find an apartment before winter. Developers and construction companies worked frantically to put together deals in Minot and hotels and apartment buildings were under construction throughout the City.

The influx of oil and gas companies and their employees, very low interest rates, significant job growth, and the demand for housing to replace units damaged or destroyed by the flood created the perfect environment for development that eventually outpaced market demand resulting in an overbuilt market rate multifamily housing market. As of September 2016, the vacancy rate for market rate multifamily housing was between 9.8 and 17 percent based on data provided from available data resources.<sup>2</sup>

Understandably market rate multifamily property owners and managers are concerned about higher vacancy rates. The vacancy rate is an important metric for property owners, investors, financial institutions, and the community. It is important to be sensitive to the full range of housing market conditions while also addressing the need for long-term affordable housing. Recommendations included in this study include monitoring of new job growth and building permit data analytics to provide developers and builders with market data that could help them avoid overbuilding in the future. And the data and analysis from this study has prompted the development of new innovative, long-term affordable housing strategies for the NDR program that consider potential impacts on



market rate multifamily housing vacancies while also creating affordable housing with 30-year affordability periods.

The market rate multifamily housing vacancy rate is declining as the population of Minot continues to grow. Based on population studies and an IMPLAN analysis developed for this study, Minot's population will increase by 9,483 people to

62,778 by 2024. This analysis is based on population data from a recent North Dakota State University study, US Census and American Community Survey data, population projections from Woods and Poole LLC, and IMPLAN economic analysis for Minot. The NDSU population data estimates that the Minot region which includes Ward County and six other adjoining counties will realize a 21.7 percent increase in population reaching a regional population of 135,292 by 2029. This represents a new population growth trajectory for Minot and the region.

While the vacancy rate in market rate multifamily housing is a very real concern that the City is taking seriously, the vacancy rate in long-term affordable multifamily housing presents a much different

<sup>2</sup> As of June 2016, Minot Apartment Association has reported multifamily vacancy rates of 10.8%; a multifamily vacancy analysis conducted for this report found a multifamily vacancy rate of 17%. The methodologies used to calculate both rates appear to be very similar.



picture. Today there are 572 units of long-term affordable housing in Minot. The vacancy rate for these units is 2.4 percent. Long-term affordable housing is rent restricted and the affordability period is 30 years. As an important regional trading center, many of the jobs in Minot are concentrated in retail trade, food services and accommodations, health care and social assistance. Many jobs in these business sectors are lower wage jobs, and while they are important to Minot's overall economy, 43 percent of households in Minot have incomes below 80 percent of the area median income, considered low income by HUD and many of these working people are housing cost burdened.

Housing affordability is essential to a resilient and prosperous economic future for Minot. While much of the community's housing needs can be addressed by the private market, providing a range of affordability for people at all income levels is important. Affordable housing strengthens the city's economy; businesses know they will have access to the workforce they need for a range of jobs. Affordable housing also enables seniors, young professionals, and families to BUY-IN to Minot or to come back home and be a part of Minot's future.

Affordable housing is a problem challenging many communities in America. Minot is in the fortunate position to have been awarded \$74.3 million in National Disaster Resilience funds that will enable the city to continue to pursue strategic and innovative solutions to create additional long-term affordable housing and achieve the legacy of resilience the community so passionately discussed throughout the NDR application process.

## Key Findings of this Housing Study

- Minot's population, including non-resident workers, is projected to increase 21 percent to 62,778 by 2024. There will be 14,376 owner households and 10,918 renter households. Today there are 13,019 single family homes in Minot and 7,375 multifamily apartments. In 2024 there will be 3,163 owner households that are housing cost burdened and 4,367 renter households that are cost burdened.
- The total number of housing units in Minot increased by almost 29 percent from 2010 to 2016, from 15,854 to 20,394. There were 1,316 new single family residences and the number of multifamily units increased by 77 percent adding 3,234 new multifamily apartments and 617 new manufactured homes (aka mobile homes) in Minot.



- By 2024, 7,530 households in Minot will be housing cost burdened; 3,163 who live in owner-occupied housing and 4,376 who live in rental housing.
- In August 2016, a survey was conducted to determine the multifamily vacancy rate. A statistically significant response rate of 63.2 percent of the total number of multifamily housing units were represented in the survey. Based on survey data received and an analysis of that data, the composite vacancy rate for multifamily housing was 17 percent. Other data sources report a lower vacancy rate of 9.8 percent.
- In the third quarter of 2016, information collected by the Minot Air Force Base Housing Office calculated average rents in Minot as follows: 1-bedroom - \$657; 2-bedroom - \$800; 3-bedroom - \$1,034.
- Based on an analysis of building permits and occupancy permits issued from 2011 to 2016, there were 184 multifamily housing units under construction in August 2016, representing a “pipeline inventory” of multifamily housing. In addition, there were 258 “foundation only” permits issued of which 48 were open/active.



- Affordable housing is determined by household income and the number of persons in the household. The generally accepted definition of affordability for housing is paying no more than 30 percent of annual household income for housing.
- There are 6,120 households in Minot with incomes below \$30,367, which is 50 percent of the area median household income and considered very low income households. Additionally, there are 2,799 households with incomes between 51 and 80 percent of the area median household income which is below \$48,576, and considered low income households
- In 2010 the average sale price for all single-family homes in Minot was \$172,880; in 2016 the average sales price for all single-family homes increased by almost \$65,000 to \$237,874.
- In 2010, 39 percent of single family homes were assessed below \$100,000, by 2016 that number had dropped to 6.5 percent. In 2010 16.5 percent of single family homes were assessed for more than \$200,000. By 2016, that number increased to 44.2 percent.

- Historically Minot's homeownership rate has been slightly lower than the national and state average. In 2016 the U.S. homeownership rate fell to 62.5 from a high of 69.2 in 2004. The most current American Community Survey data available shows that in 2014 Minot's homeownership rate was 60.7.
- Construction, retail trade, health care, and accommodations and food services accounted for 57.3 percent of those employed in Minot in 2016.
- The senior population is leaving the northwest North Dakota region in record numbers; primarily due to the cost of housing. According to the 2014 Census, Minot's senior population declined slightly and the senior population in Bismarck, Grand Forks, and Fargo increased. By 2029 however, the senior population in Minot is projected to increase by 35 percent. The 2014 median income for Minot residents over the age of 65 is \$36,046 and many are housing cost burdened.
- Part of the National Disaster Resilience program, the Buy-Out/Buy-In program is helping move people out of harm's way and facilitate construction of the flood control project. This program will acquire an additional 109 single family homes, 9 multifamily properties with a total of 61 apartments, and 5 parcels where 432 mobile homes are located, for a total of 602 Buy-In properties. Many property owners/renters will have resources to acquire market rate housing in Minot. However based on estimates of low and moderate income residents, an estimated 500 households may need access to long-term affordable housing.

*"At the peak of the June 2011 flood, 12,000 people were evacuated from their homes in Minot. There were fewer than 300 people in the shelters that had been set up, however, and they were there only for a short period of time. Families, friends, coworkers, and even strangers who became like family shared their homes, their dinner tables, and their compassion with neighborhoods who had lost everything. That is the story of Minot. We're a community that works hard every day to provide, power, and protect, and when we're faced with great adversity we step up and help one another. We hope this proposal reflects our earnest commitment to help everyone in our community recover from the flood. We realize now that we must dedicate ourselves to a legacy of resilience so this region will continue to build on what we've learned through this resilience process."*

excerpt from the Executive Summary of  
Minot's National Disaster Resilience Competition  
Phase II Application



## Section 2: Introduction

*City of Minot, North Dakota*





## Section 2: INTRODUCTION

The housing market in Minot has changed dramatically since the unprecedented flooding in 2011. Nearly 4,200 homes, almost 27 percent of the city's housing stock, were damaged or destroyed as a result of that event. Since the flood, over \$121 million in CDBG-DR funds and other federal, state, and non-profit resources have been invested in affordable housing to rehabilitate damaged homes, demolish and reconstruct housing that was destroyed, or develop new affordable housing in Minot. In addition to CDBG-DR investments, many homeowners and multifamily property owners have spent millions of dollars from insurance proceeds and personal resources to repair or rebuild their residential property.

Minot's housing market was further impacted by a second dramatic shock, the Bakken oil boom, which began to affect the cost and availability of housing in late 2010. The combination of the flood disaster and the economic shock of the oil industry sent housing costs soaring. Vacancy rates were near zero for several years, many families were forced to live in FEMA trailers far longer than they expected; and others could not find affordable housing and were forced to move away from Minot. The housing impacts of this dual disaster/shock were felt throughout the community. The flood displaced 567 Minot State University students. An influx of hundreds of oil workers resulted in significant increases in rent, which gave rise to fewer affordable housing options for students, contributing to a 7.3 percent decline in enrollment at the university after the flood. The U.S. Congress provided a significant increase in the active duty military housing allowance for personnel at Minot Air Force Base, the region's largest employer. The additional housing allowance allowed military personnel to secure off-base housing they could afford in the face of rapidly increasing rents. Unfortunately, civilian employees crucial to base operations do not receive any housing stipend and some civilian employees could not afford housing in Minot. Prior to 2016 the lack of affordable off-base housing the base made it difficult to attract civilian personnel to fill base employment opportunities.

While single family housing costs increased exponentially during this period, the increase in multifamily rents was even more dramatic. In 2010, 2-bedroom apartments in Minot were renting for an average of \$600 per month. However, by the fourth quarter of 2012 the average monthly rent for a 2-bedroom apartment was \$1,312.88, a 118 percent increase.<sup>3</sup> Thirty-six percent of households nationally live in rental housing, however thirty-nine percent of Minot's population lives in rental housing, and in 2012 40 percent of those renter households were considered cost burdened for housing, meaning they paid more than 30 percent of their income for housing.<sup>4</sup> Although rents and single family housing costs have moderated in the past year, the next increase in petroleum prices

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<sup>3</sup> FEMA Housing Portal for Minot and Minot AFB Housing Database

<sup>4</sup> 2010 U.S. Census Bureau, American Community Survey, 2011 household income data

could result in another cycle of rising housing costs and increasing the housing cost burden on more families in Minot.

As the regional trading center for northwestern North Dakota and southern Manitoba and Saskatchewan, Minot provides goods and services to a broad bi-national region. As a result, the city has historically had a higher percentage of employment in services, health care, and wholesale and retail trade. These business sectors are vital to the city and the region's economy. However, some of the jobs within these sectors have wages well below the area median income. Retail clerks, medical technicians, agricultural equipment mechanics, material handlers, and certified nursing assistants vital to core business operations often do not earn incomes that enable them to afford the housing options in Minot, even in 2016. (See Section 6: for data on wages and housing cost burden)

## 2.1 The City of Minot's Award-winning National Disaster Resilience Competition (NDRC):

In 2014, the U.S. Department of Housing and Urban Development announced a two-phased process to award funding for resilience and disaster recovery through a competitive process to eligible communities who experienced major disasters in 2011, 2012, and 2013. At the close of Phase 1 of the NDRC, 40 states and communities including Minot were invited to submit a Phase 2 application. Phase 2 applications focused on cutting-edge projects that addressed unmet needs from past disasters and created opportunities to build more resilient communities. These projects would move residents out of harm's way, help avoid future damages and losses, and ensure the needs of the city's vulnerable populations were addressed.

The Department of Housing and Urban Development established six goals for this competition:<sup>5</sup>

- To fairly allocate remaining PL 113-2 CDBG disaster recovery funds;
- To create examples of “best practices” responding to local disaster recovery that apply science-based and forward-looking risk analysis to address recovery, resilience, and revitalization needs;
- To leave a legacy for the implementation of thoughtful, innovative, and resilient approaches to address future risks;
- To provide resources to help communities plan for and implement disaster recovery that makes them more resilient to future threats or hazards, including extreme weather events and climate change, while also improving quality of life for existing residents and making communities more resilient to economic stresses or other shocks;
- To fully engage and inform community stakeholders about the current and projected impacts of climate change and to develop pathways to resilience based on sound science; and

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<sup>5</sup> Department of Housing and Urban Development, National Disaster Resilience Competition, Notice of Funding Opportunities, Phase 1 and 2, 2014 and 2015.



- To leverage investments from the philanthropic community to help communities define problems, set policy goals, explore options, and craft solutions to inform their own local and regional resilient recovery strategies.

One of only 13 recipients nationally, Minot's application was awarded **\$74.3 million dollars**. During the NDRC application process the city hosted over 70 advisory committee and public meetings which engaged hundreds of local residents. Two charrettes were held, one at Minot State University and one at a local church. Participants in these charrettes, and at a later Community Advisory Committee and public meeting, identified the resilient neighborhood features that mattered most to them. These features included: mixed housing densities; quality and affordable designs; walkability; access to transit, jobs, and services; and green open spaces. Those who participated in these NDRC meetings determined what projects would be included in the city's NDRC application because they best achieved the disaster recovery and resilience vision identified by the people of Minot.



There are three overarching goals in Minot's National Disaster Resilience (NDR) application:

- Reduce flood risk to address the needs of our most vulnerable, provide benefits in the near term as well as long-term, support local land uses, layer with existing flood protection plans;
- Increase the supply of quality affordable housing for our most vulnerable residents in a manner that fosters livability and the long-term viability and sustainability of neighborhoods; and
- Foster a robust, diverse, and healthy economy that enables the region to weather disruptions from physical as well as economic shocks.

This integrated approach is designed to foster recovery and resilience in Minot and the region. Success means being better prepared for future natural disasters and the impacts resulting from a downturn in the oil industry, as well as being better equipped to respond to the inevitable oil boom that will occur again at some point. This study documents housing supply and demand since 2013 mid-way through the up side of the oil cycle. Housing production during the boom period resulted in an "over-built" multi-family housing market in Minot and vacancy rates that the community had not previously experienced. This study also evaluates future population growth projections, potential

non-resident worker impacts, and the effects of the “Buy-out-Buy-in” program that is a part of the NDR initiative.

Ultimately, this study provides data and analysis to help the City of Minot and its partners fine-tune their program to build long-term affordable housing in resilient neighborhoods. A stable supply of affordable housing will:

- Enable Minot to become a more resilient community;
- Allow local businesses to better sustain their workforce during the up and down cycles of the oil industry;
- Enhance the region’s economic development, diversify the economic base, and enable major employers and small businesses (including Minot State University, the Minot Air Force Base, and Trinity Hospital) to retain and attract the best employees; and
- Enable those residents who helped to build and nurture this community avoid relocation and enjoy their retirement here in Minot and allow young families and new residents to locate to the community and help make this place an even better place to live, work, and play.



# Section 3: 2016 Housing Market Profile

*City of Minot, North Dakota*







## Section 3: 2016 HOUSING MARKET PROFILE

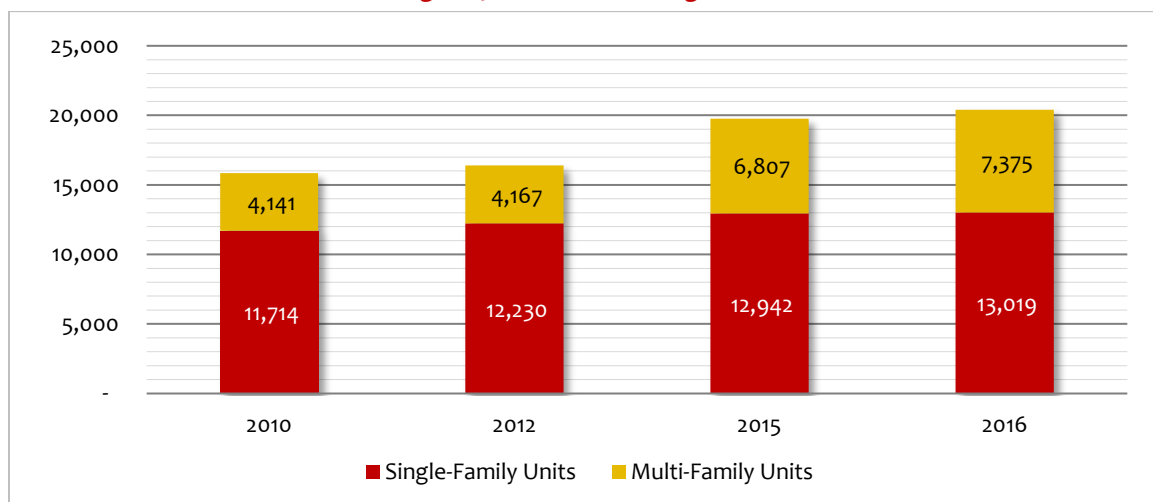
The economic recession that affected most of the U.S. essentially by-passed North Dakota. When new technologies enabled cost effective extraction of Bakken oil reserves, northwest North Dakota suddenly became the center of an economic and construction explosion as population and job growth increased dramatically. Population projections from several sources estimated a 7.58 percent to 9.83 percent increase in Minot's population from 2010 to 2012.<sup>6</sup> As the region was being inundated by new oil industry workers, construction employees, and retail and wholesale trade personnel the 2011 floods wiped out nearly 27 percent of the city's housing stock, thereby creating conditions unlike any previously experienced by an American city, except perhaps during the California gold rush.

### 3.1 Market Rate Multi-Family Housing

#### 3.1.1 Current Inventory

In 2012, a wise local realtor said, *"it isn't a question if we will overbuild housing in Minot, it is just a question of when."* From 2010 through June 2016 the total number of housing units in Minot increased by almost 29 percent, from 15,854 to 20,394.<sup>7</sup> This included 1,316 new single family residences and 3,234 multi-family apartments constructed in less than 6 years. There were also 1,835 manufactured homes (aka mobile homes) located within the city by 2016.<sup>8</sup> (See .)

Figure 3.1: Minot Housing Units



<sup>6</sup> U.S. Census, American Community Survey Population Projections 2012; 2010 U.S. Census + IMPLAN model analysis prepared by CDM Smith in 2013 Housing Supply and Demand Analysis; 2012 North Dakota Statewide Housing Needs Assessment population projections, NDSU.

<sup>7</sup> Minot City Assessor housing data, 2016

<sup>8</sup> Ward County, North Dakota Mobile home data, 2016

Market-rate housing units have no rent restrictions. The property owner is free to rent the property at any price the local market will bear, with terms and conditions generally determined solely by the landlord and tenant. These rentals are not restricted by affordable housing laws or regulations. The number of multi-family housing units increased by **77 percent**, from 4,141 units in January 2010 to 7,375 units at the close of the third quarter of 2016.<sup>9</sup>

Job creation and population growth are the primary demand drivers for new housing. Many experts agree the baseline for concern regarding overbuilding for multifamily housing exists when the ratio of jobs to new multi-family permits exceeds 5-to-1. In northwestern North Dakota, the rapid job growth cycle and multi-family permitting/construction did not align quickly enough with market changes to enable traditional data monitoring and provide effective metrics for the marketplace. Regionally, Minot's Assessor and Building Inspections Offices maintain excellent residential permitting, occupancy, and valuation data. However, many other counties in this region do not have similar data available which would be beneficial to the evaluation of overbuilding.

### 3.1.2 Current Vacancies

As a result of housing inventory loss from the 2011 flood and the in-migration of oil sector workers, Minot's multi-family housing inventory experienced vacancy rates near zero during the last two quarters of 2011. This rate continued well into 2014. These conditions, coupled with very low interest rates, helped stimulate the construction of thousands of new apartments. Some of these were developed and constructed by those from other regions of the country not familiar with the cycles of the oil sector and the Minot market. During that timeframe, it was not uncommon for people actively looking for housing to place their names on waiting lists; properties commanded premium rents with 12- to 24-month leases; and many of the city's hotels had record occupancy rates.

Today, conditions have changed dramatically. As oil prices declined, jobs associated with the oil sector in northwestern North Dakota decreased and vacancy rates across the region increased. In April 2015 Minot's market rate multi-family housing vacancy rates were reported at 4.9 percent and by October 2015 that number had risen to 10.8 percent.<sup>10</sup> Anecdotal estimates of the 2016 vacancy rates range from 9.8 percent to 28 percent. In Williston, vacancy rates as high as 50 percent are reported, while rates in Williams County "man camps" may be over 70 percent.<sup>11</sup> Although vacancy rates in Minot are substantially lower, concerns regarding the financial implications of higher vacancy rates are very real for the owners and managers of multi-family apartments experiencing lower than anticipated occupancy rates.

The market rate multi-family vacancy rate is an important metric for property owners, investors, managers, financial institutions, and communities. It describes the percentage of available multi-family units that are vacant at a specific point in time, or an average vacancy rate for a specific time period. Available multi-family units were determined by matching certificates of occupancy issued by the Minot Building and Inspections Department with building permits, with the total being vetted

<sup>9</sup> This number does not include duplexes or triplexes which may include one or two units for rent.

<sup>10</sup> Associated Press, November 23, 2015, "Minot's apartment vacancy rate rises with oil slowdown"

<sup>11</sup> Bloomberg News, September 29, 2015, "The Real Estate Crisis in North Dakota's Man Camps"

based on property inventory data from the Minot Assessor. The study team also discussed the data with professional staffs within these city departments.

To gain a more accurate understanding of market-rate vacancies within Minot's multi-family housing sector, the study team reviewed U.S. Census American Community Survey housing data that tracks the number of housing units, either occupied and unoccupied. Although this data source is reliable, the lag time between data collection, assessment, and publication cannot track the dynamic changes in Minot's housing and employment sectors. Therefore, the team determined this data lacked current value for this analysis.

Data from other sources, including the U.S. Postal Service that provides information which determines if mail is being actively delivered and received at addresses, are helpful in many cases. Again, the timeliness of that data was also an issue. As a result, it was determined that a survey of market rate multi-family owners and/or property managers was the best way to secure the most exact measure of vacancy. Questions were developed to:

- assess the number of vacant units by the number of bedrooms,
- rent ranges by number of bedrooms,
- quantity of total units by number of bedrooms,
- a subjective evaluation of quality of units by respondent, and
- amenities included in the rent.

To ensure all potential respondents received the same instructions and information, before the survey was deployed a detailed description of procedures was developed. Due to the sensitive nature of the information being requested, confidentiality of all individual survey responses was kept. A minimum sample size was determined to ensure a statistically significant and representative pool of data. Subsequently, a list of respondents was identified. Survey questions were developed and reviewed with research experts to ensure the survey was concise and clearly understandable. Potential survey respondents were contacted to provide a brief summary of the research purpose and how the responses would be used.

The survey was conducted in August 2016. Responses represented a statistically significant rate of 63.2 percent of the total number of multi-family housing units in Minot. Based on survey data received and analysis of that data, the composite vacancy rate for multi-family housing units was **17 percent**.<sup>12</sup> Although this vacancy rate is high, it does not indicate the kind of systemic long-term housing problems found in cities like Detroit, Michigan; Youngstown, Ohio; Beaumont, Texas; or Atlantic City, New Jersey. The vacancy rate in Minot is the result of dramatic overbuilding and a cyclical downturn in the oil sector. Although this outcome was foreseen, there was some hope that the "mid-course" correction in oil prices would not occur quite so quickly. Unfortunately, the oil sector generates economic whiplash with some regularity.

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<sup>12</sup> 2016 Multi-family housing vacancy and rent survey, Minot, ND, conducted by CDM Smith



Of the 4,662 units included in the survey, studio apartments had the highest vacancy rate at 29 percent. The vacancy rate for 1, 3, and 4 bedroom units was 15 percent. Two-bedroom units represented 61 percent of the number of units surveyed and had a vacancy rate of 17 percent.

### 3.1.3 Current Rental Rates

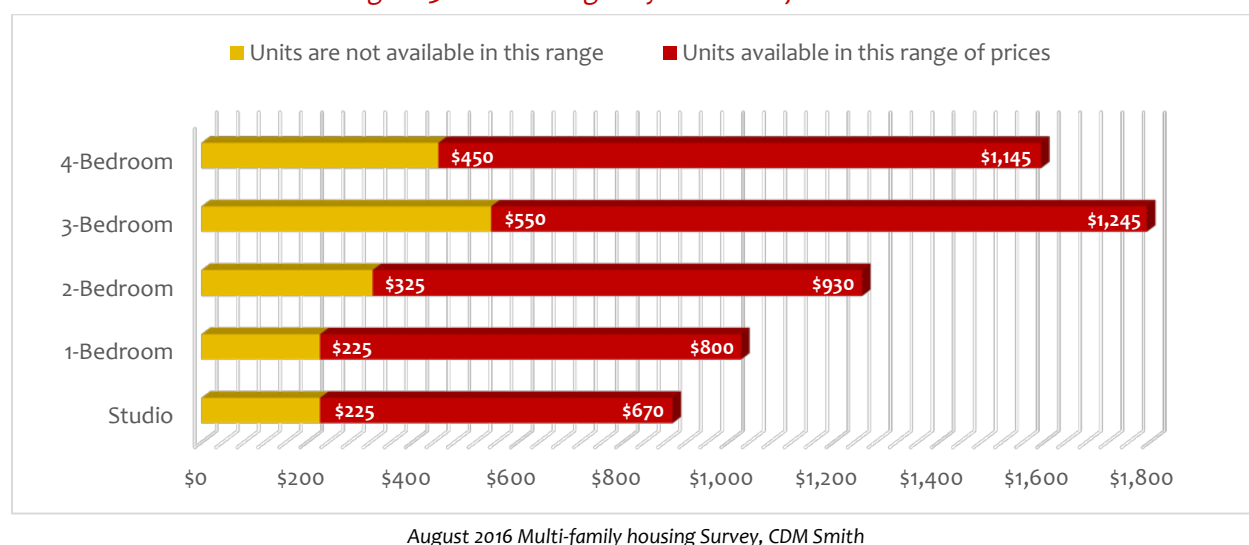
In July 2016, the study team contacted 15 apartment complexes in Minot requesting information regarding current rents for 2-bedroom apartments. These complexes were selected from realty advertising in the Minot Daily News and local real estate publications. One complex had two-bedroom apartments available for \$555 - \$605 per month with a \$300 security deposit. Six developments reported rents for a two-bedroom unit from \$775 - \$850. Eight multi-family communities were offering 2-bedroom units from \$950 to \$1620 per month. The Housing Office at the Minot Air Force Base conducts rent studies on a regular basis.<sup>13</sup> The average rents based on their analysis for the 4<sup>th</sup> Quarter 2016 are shown in **Table 3.1**.

*Table 3.1: Average Rents, 4<sup>th</sup> Quarter 2016*

# of Bedrooms	Average Rents
1	\$675
2	\$800
3	\$1,034

Most respondents to the August 2016 survey included rent information aggregated for the total units within each bedroom classification. However, many respondents provided a range of rents, making it difficult to determine an average rent based on number of bedrooms. (See **Figure 3.2**) Research within Minot indicated that, in some cases, the lowest rents are available to tenants willing to execute shorter lease terms with the highest rents charged for longer lease periods. Given an expectation that oil prices are slowly increasing, it is understandable that property owners would prefer to maintain flexibility in order to maximize their returns in response to market demand. Other factors affecting rent rates include amenities available to tenants, inclusion of some utilities, and other incentives.

*Figure 3.2: Rent Ranges by Number of Bedrooms*



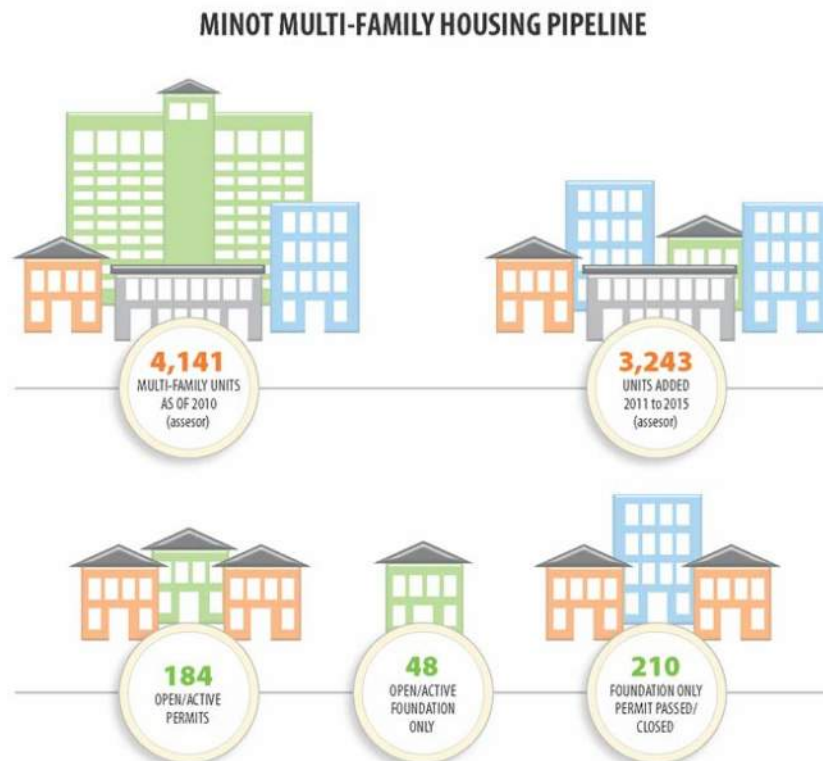
<sup>13</sup> Information provided by Tim Knickerbocker, Chief of Housing, Minot Air Force Base, 4<sup>th</sup> Quarter 2016 data

### 3.1.4 Summary

As long as the Bakken oil fields remain in operation, the cycles of the oil industry, in conjunction with the currently over-built market in Minot, can impact rents and housing availability. Over time, as factors such as population growth and the NDR buy-out/buy-in program create new demand, the vacancy rates in market rate multi-family housing will certainly decline and rents will normalize. Fortunately, Minot has not experienced high, long-term housing vacancies. Properties which remain vacant over a long period of time and are more likely to contribute to blight, high foreclosure rates, and abandonment. Areas that experience higher levels of long-term residential vacancies generally have a low housing demand and a very weak housing market. Minot should continue to monitor housing conditions to ensure that areas where higher vacancies or abandonment occur are quickly identified and addressed using tools that are already available. In addition, recommendations for monitoring residential building permits, job growth, and other analytics should be considered and policies developed that could help avoid overbuilding in future oil cycles.

## 3.2 “Pipeline Inventory,” Existing Foundations Permits

Field inspections of several new construction sites in the summer of 2016 raised concerns about the number of housing units under construction but not completed or ready for occupancy and evidence of some abandoned structures. The study team conducted a comparative analysis of multi-family building permits and certificates of occupancy issued from 2011 to 2015 to determine how many multi-family units were under construction or where construction was not completed to occupancy standards. While not currently included in the vacancy rate analysis, these units represent housing that should come on-line and be available for occupancy in the future. This analysis was used to develop a “pipeline inventory” of multi-family units at various stages of completion.



Based on this analysis, there were open/active building permits for 184 multi-family housing units with expiration dates between January 2016 and February 2017. In addition to these units, there were

258 “foundation only” permits issued of which 210 have been passed/closed and 48 are open/active. These sites should be monitored to assess the viability of these foundation structures.

### 3.3 What is “Long-Term Affordable Housing”?

What is affordable housing and why does it matter to Minot? When that question was posed to a group of community leaders, business owners, and residents during community meetings in 2012 the responses were compelling. Many people and businesses had experienced first-hand what the loss of affordable housing after the flood meant in Minot. People lost their homes or had significant damages not covered by insurance. Displaced residents coupled with a major population influx due to the oil industry, caused housing costs to skyrocket and availability to plummet. Lack of affordable housing contributed to difficulty in filling critical positions at Trinity Hospital, the City of Minot, and many businesses both large and small.

When the supply exceeds the demand, rents become more affordable to a wider range of families and households in the community. When the demand for housing increases the rents that are more affordable today will rise to levels that are unaffordable for a larger percentage of Minot’s population. One of the more serious challenges to Minot’s resilience is the significant economic stresses from the boom-and-bust economic cycles created by the oil production sector. For more than 100 years, the oil industry in the U.S. has experienced frequent boom-and-bust cycles. When times are good, the boom generates employment and population growth that often puts pressure on local housing markets. When oil prices drop, unemployment increases, economies are stressed, and there is a slowdown in housing demand.

The timing of these cycles, employment and population growth or decline, and the impacts on housing are impossible to predict. One of Minot’s primary NDR resilience projects is focused on a more robust, diverse, and healthy economy that will help to diversify economic opportunities in Minot and the region. A stable housing market and an inventory of long-term affordable housing in resilient neighborhoods will help to support stronger economic resilience.

Developing long-term affordable resilient housing is not an easy task. A recent report from the Joint Center for Housing Studies at Harvard University found that almost 25 percent of renters in America are housing cost burdened.<sup>14</sup> In many communities, property near transit services that is walkable to grocery stores, parks and recreations, and schools has become too expensive for more affordable housing. Competition for federal tax credits has increased and other resources that supported development of more affordable housing in the past has not kept up with the need. There are fewer resources to help finance a project that is truly affordable long-term to those making less than 80 percent of AMI in Minot. However, the National Disaster Resilience award gives Minot an opportunity to do something about this challenge and make a difference in the city’s economic future at the same time.

Long term affordable housing incorporates legal and regulatory requirements that protect the affordability of quality housing to ensure that it remains affordable for a 20- to 30-year period

<sup>14</sup> “The State of the Nation’s Housing 2016,” Joint Center for Housing Studies, Harvard University



depending upon the subsidy or equity programs used to provide financing for a project. In order to provide affordable housing for people with incomes below 50 percent of AMI, an additional subsidy is required in addition to low-income housing tax credits which might include funding from other federal or state programs.

### 3.4 How is “Long-Term Affordable Housing” Determined?

Affordable housing is determined by household income and the number of persons in the household. What is affordable to a family of 5 making \$120,000 per year will not be affordable to a family of 4 earning only \$42,000. The generally accepted definition of affordability for housing is paying no more than 30 percent of annual household income for housing including utility costs. Given rents in 2012, 48 percent of Minot households could not afford the median rent for a two-bedroom apartment and 70 percent could not afford the median rent for a three-bedroom unit. At that time, over 40 percent of Minot’s population living in rental housing was cost burdened.<sup>15</sup> Today, 40 percent of renters in Minot are still housing cost burdened.<sup>16</sup>

The FY 2016 median family income for Ward County is \$73,200.<sup>17</sup> Based on HUD regulations, the income thresholds for housing assistance is generally restricted to households with incomes below 80 percent of area median income (AMI). HUD provides guidance on income limits based on number of persons in the family and sets extremely low income limits (greater of 30/50<sup>th</sup> of the Section 8 very low income limit), very low income limits (50% AMI), and low income (80% AMI). **Table 3.3** shows the FY 2016 income limits applicable to HUD and HHS housing programs.

*Table 3.2: FY 2016 HUD and HHS Housing Program Income Limits*

FY 2016 Income Category	Persons in Family					
	1	2	3	4	5	8
Extremely Low Income	\$15,450	\$17,650	\$20,160	\$24,300	\$28,440	\$40,890
Very Low Income	\$25,750	\$29,400	\$33,100	\$36,750	\$39,700	\$48,550
Low Income	\$41,200	\$47,050	\$52,950	\$58,800	\$63,550	\$77,650

Fair Market Rents (FMR’s) are used to set payment standards and rents for several HUD assisted housing programs including Housing Choice Vouchers, expiring Section 8 contracts, housing assistance payment contracts in moderate rehab Single Room Occupancy (SRO) programs, rental assistance units in HOME Investment Partnerships programs, and public housing. The Minot Housing Authority (MHA) manages the Housing Choice Voucher program in the city. This is a federal program that provides a housing voucher enabling low-income families, seniors, and persons with disabilities to secure quality housing within the private marketplace. Housing rented through this program must meet HUD’s Minimum Property Standards and the owner must agree to certain requirements to participate in this program. A housing subsidy is paid to the landlord by MHA and the eligible family

<sup>15</sup> “Minot Affordable Housing Strategy Supply and Demand Analysis”, December 2012, CDM Smith

<sup>16</sup> 2015 U.S. Census American Community Survey Housing data

<sup>17</sup> U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2016

pays the difference between the allowable fair market rent charged for the unit and the amount covered by the voucher. (See **Table 3.4**)

*Table 3.3: FY 2010 – 2016 Fair Market Rents, Ward County, North Dakota*

Year	Studio Efficiency	1-Bedroom	2-Bedroom	3-Bedroom	4-Bedroom
2016	\$796	\$896	\$1,173	\$1,697	\$1,999
2015	\$812	\$866	\$1,142	\$1,683	\$1,752
2014	\$794	\$847	\$1,116	\$1,644	\$1,712
2013	\$773	\$825	\$1,087	\$1,602	\$1,667
2012	\$449	\$558	\$686	\$947	\$1,124
2011	\$422	\$525	\$646	\$892	\$1,059
2010	\$413	\$512	\$631	\$872	\$1,035

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2016

A family's eligibility for a housing choice voucher is based on the family's total annual gross income and family size. Generally, a family's income "may not exceed 50 percent of the median income for the county in which the family chooses to live and by law the housing authority must provide 75 percent of its vouchers to applicants whose incomes do not exceed 30 percent of the AMI."<sup>18</sup>

The Housing Choice Voucher Program is the federal government's largest rental assistance program. Funding is provided through an annual federal appropriation for HUD and subsequently HUD allocates these funds to public housing authorities based on guidance contained in the appropriations act. As of 2016 a new funding formula will be used to allocate these funds based on cost data and a complex set of proration factors created and applied to all eligible housing authorities. The details contained in the 2016 appropriations action and the new funding formula for 2016 can be found in Notice PIH 2016-04, Implementation of Federal Fiscal Year 2016 Funding Provisions for Housing Choice Voucher Program.

Metropolitan areas and many non-metro areas receive housing choice vouchers. The demand for housing assistance exceeds the funding available to HUD to support the voucher program and many housing authorities establish waiting lists for vouchers. There are currently 850 families on the Minot Housing Authority waiting list for Housing Choice vouchers, the largest waiting list the MHA has experienced. While the Housing Choice vouchers are a valuable tool for providing rental assistance to families, there are several weaknesses in the program that created real problems for low income families in Minot over the past 5 years.

MHA receives a specific allocation of funding for vouchers, the housing assistance is based on the housing assistance payment less 30 percent of the family's monthly adjusted income or gross rent less 30 percent of the family's monthly income whichever is less. When rents increased as they did from 2011 to 2015, MHA was forced to increase the amount of housing assistance payments per unit and thus fewer families could be assisted. At the end of their annual lease term, many landlords dropped out of the voucher program as rents surged so they could take advantage of the

<sup>18</sup> U.S. Department of Housing and Urban Development, Housing Choice Voucher Program

opportunity to charge rents that exceeded the fair market rents established by HUD. Families who had previously received rental assistance were suddenly displaced and there were no available affordable housing options in Minot. Families were forced to relocate outside of Minot, some moved in with family or friends for a while, and some families became homeless and accepted bus tickets to Bismarck or Fargo to shelters there.

The Housing Choice voucher program is an invaluable affordable housing tool but it only provides affordable rent for one year as long as housing options that meet the fair market rents are available. As many families and businesses learned all too well as rents skyrocketed during the oil boom, the voucher program's shortcomings are fully exposed when rents are increasing and demand for affordable housing is on the rise.

As the regional trading center for northwestern North Dakota, employment in Minot is concentrated in retail trade, health care and social assistance, accommodations and food, construction, transportation and warehousing, and mining and oil and gas extraction. Employment in many of these vital economic sectors provide average annual wages well below Minot's 2016 median income of \$73,200. (See **Table 3.5.**)

*Table 3.4: Employment Concentrations, Average Wages, Affordable Housing for Ward County*

Job Classification	Percent Employment (2015)	Average Weekly Wage Rates (2015)	Average Annual Wage Rates (2015)	Affordable Housing Costs 30% of Average Wages
Construction	9.1%	\$1,261	\$65,593	\$1,640
Retail Trade	19.6%	\$599	\$31,151	\$779
Health Care & Social Assistance	15.2%	\$1,171	\$60,892	\$1,522
Accommodation & Food Services	13.4%	\$345	\$17,964	\$449
Transportation & Warehousing	5.9%	\$1,046	\$54,414	\$1,360
Mining, Quarrying, and Oil & Gas Extraction	5.6%	\$1,950	\$101,407	\$2,535

Source: Job Service North Dakota, 2015 Employment and Wages by Industry

For example, a teacher just starting their career in Minot would earn a starting salary of \$39,250 and could afford to pay \$981 per month for rent and utilities. Entry level police/fire fighter or EMT could afford \$1,117 for monthly rent and utilities.<sup>19</sup> Even with the lower rents available in Minot's housing market today, over half of the multi-family units included in the rental survey would not be affordable to these essential professionals. Given current average wages in North Central North Dakota, employees in several the business sectors with the highest concentration of employment in Ward County cannot afford housing in Minot even in today's market.

<sup>19</sup> Starting salary information for Minot, Job Services North Dakota, 2016



### 3.5 “Long-Term Affordable Housing” Vacancies

The 2011 flood damaged an area of the city with the highest percentage of affordable housing, many were well maintained older houses that also provided basement apartments that housed Minot State University students. Most of the homes in the flood inundation area have been repaired and will be protected by the flood control project now under construction.

There are affordable rents within Minot in unsubsidized, privately owned housing. The availability of affordable rents in these units depends on the region’s housing market, the local economy, and other factors and as these conditions change these property owners will make decisions about the rents they charge their tenants. There are property owners who make a conscious decision to keep rents affordable to keep occupancy rate high and avoid the costs of tenant turn-over. These property owners often have greater flexibility to make those decisions due to lower costs when the units were developed. Many of the privately owned affordable rentals are smaller developments. According to the U.S. Census, 92 percent of multi-family rentals with 10 or fewer units are owned by individual investors.<sup>20</sup>

### LOW VS. VERY LOW INCOME HOUSEHOLDS (2015)



<sup>20</sup> U.S. Census “Property Owners and Managers Survey,” 2000

The vacancy rate in long-term affordable housing is significantly lower than the 17 percent for market rate multi-family housing as determined by the August 2016 survey. 572 units of long-term affordable housing currently available in Minot and the vacancy rate for these apartments is **2.4 percent**.<sup>21</sup> Based on the most current census data, there are 8,077 households in Minot, which would qualify for long-term affordable housing (incomes below 80 percent of the area median income).

### 3.6 Analysis of 2016 Single Family Housing in Minot

In the past five years, new residential construction in Minot has been in over-drive. During that time the city's housing inventory grew by over 30 percent as 4,550 new housing units were built, 617 new manufactured homes were located in the city, and the number of multifamily units increased by 78 percent. There were 1,316 new single family homes constructed, an 11 percent increase over those available in January 2011. Although the majority of new construction activity was concentrated in multi-family rental housing, dramatic changes in the single-family housing inventory occurred since 2011. Four primary factors influenced these changes:

1. Because of the 2011 flood 2,376 homes had extensive damage and 805 homes were damaged beyond repair reducing the existing housing inventory;
2. The influx of jobs and population from the expanding oil industry sector increased housing occupancy rates to 99 percent;
3. Significant increases in the construction of new housing; and
4. The extension of water and sewer infrastructure to support construction of new housing.

### 3.7 Current Single Family Housing Inventory

In 2010, 69 percent of Minot's housing stock was single-family housing, 24 percent of the housing units were multifamily, and 7 percent of the available housing inventory was manufactured housing or mobile homes. Today the city's housing inventory has changed significantly, 59 percent of the housing stock is single-family housing, 33 percent multifamily, and 8 percent manufactured housing or mobile homes.<sup>22</sup> Historically Minot's homeownership rate has been slightly lower than the national and state average. In 2016 homeownership in the U.S. fell to 62.5 percent, its lowest level since 1965 compared to a high of 69.2 percent achieved in 2004. In the State of North Dakota homeownership rates were at a high of 71 percent in 2001, but declined to 65.1 percent in 2014. By comparison, Minot's homeownership rate was 62.4 percent in 2000 and declined to 60.7 percent in 2014, the most current data available. These lower ownership rates are due, in part, to the presence of the Minot Air Force Base and Minot State University.

Homeownership is not always a viable option for military personnel since they often have access to on-base housing, move on average every 2 to 3 years, and may be deployed away from a base for

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<sup>21</sup> Vacancy data from Minot Housing Authority, Beyond Shelter, and LIHTC units, 2016

<sup>22</sup> City of Minot Assessor 2016 property data. There are fewer than 2,000 single family rental units in the city and 450 single family homes that are duplex or 3-plex unit, thus the difference between the single-family housing stock and the homeownership rate.

extended periods. In 2014, nationally only 34 percent of military households were homeowners compared to 64 percent of non-military households.<sup>23</sup> Minot State University has a limited number of on-campus housing options for students, however upper class students frequently choose nearby off-campus housing. Housing availability and very high rents were significant obstacles for students after the flood affecting university enrollment for several years. According to University Administrators, while housing availability and costs are not currently a concern for students, the university continues to monitor the housing market and its potential impact on students and university enrollment.

### 3.8 Factors Affecting Single Family Home Sales in Minot

Several local real estate professionals report a slowdown in the sale of more affordable, starter homes in 2016. Multiple Listing Service (MLS) data that tracks the average number of days homes are for sale indicates that homes less than \$175,000 are not selling as quickly as they did previously for homes in this price range. (Table 3.6) Based on the professional judgement of local realtors and observations from several multifamily property managers, lower apartment rents and units with more amenities (including granite counters, underground parking, pools, community rooms, and outdoor play areas) make apartments more attractive to moderate and middle income residents. Also, many military families who have seen the volatility in Minot home prices in the past few years are reluctant to purchase a home knowing they will shortly relocate and face an increased chance of an upside down in a mortgage in this market.

*Table 3.5: Sales of Single Family Homes below \$175,000,  
Sold from January 1 to September 30 by Year*

Comparison Year	Total Sold	Days on the Market
2016	111	Ave. 113 Days
2015	109	Ave. 86 Days
2014	113	Ave. 107 Days
2010	292	Ave. 73 Days

The dramatic changes in housing values over the past few years creates significant challenges for potential homebuyers, builders, developers, property managers and owners. Over-building in the multifamily market resulted in an over-supply of units resulting in declined rents. When rents are more affordable and high-end amenities provide more benefits than many single-family subdivisions, some potential homebuyers may elect to forego purchasing a home.

### 3.9 Single Family Value and Location

Housing values in Minot have changed significantly in the past five years. () In 2010, 83 percent of the city's single family housing stock was valued between \$50,000 and \$200,000. By 2016 only 55.8 percent of the single-family market was valued below \$200,000, confirming that significantly fewer

<sup>23</sup> 2014 American Community Survey data, U.S. Census Bureau

affordable single family homes are available in the community today.<sup>24</sup> The median assessed valuation of single-family housing in Minot increased from \$131,600 in 2010 to \$191,000 in 2016. Today over 12 percent of the City's housing stock is valued at or above \$300,000, compared to 0.7 percent in 2010.

*Table 3.6: Single-Family Units Assessed Value*

Value	2010	2016
≤ \$50,000	5.6%	1.1%
\$50,001 - \$100,000	22.3%	5.4%
\$100,001 - \$150,000	35.0%	20.9%
\$150,001 - \$200,000	20.0%	28.4%
\$200,001 - \$300,000	14.2%	32.1%
\$300,001 - \$400,000	2.2%	9.2%
≥\$400,001	0.7%	2.9%

shows the annual average sales price for single family homes in Minot from 2010 through September 2016.<sup>25</sup> The price of single family housing in Minot, including existing and newly constructed units, increased by almost 64 percent during this period.

*Table 3.7: Residential Home Sales Price in Minot*

Year	Average Sales Price All Single-Family Homes	Average Sales Price Single Family New Construction
2010	\$172,880	\$246,128
2014	\$241,174	\$322,284
2015	\$240,665	\$348,185
2016	\$237,874	NA

Minot MLS Data, 2010 – 2016

As single family housing in Minot has become more expensive, there has been a significant decline in the number of more affordably priced homes sold. shows the breakdown of single family housing sales by selected price ranges for 2010, 2014, 2015 and through September 2016.

*Table 3.8: Breakdown of Single Family Housing MLS Sales*

Sales Price	Number of Homes Sold			
	2010	2014	2015	1/1 to 9/30 2016
0 - \$200,000	445	260	210	163
\$200,000 – \$250,000	112	139	118	78
\$250,000 – \$300,000	36	118	113	55
\$300,000 – \$350,000	16	77	76	51
\$350,000 – \$400,000	2	47	29	24
\$400,000 +	9	36	35	21

Minot MLS Data 2010 – 2016

<sup>24</sup> Single-family housing assess valuation, July 2016, City of Minot Assessors Office

<sup>25</sup> Minot MLS Data 2008 - 2016



According to data provided by the City of Minot Assessor, Kevin Ternes, in 2010 88 percent of the homes sold in Minot had a sales price below \$250,000; by 2015 only 60 percent of the homes sold were less than \$250,000; from January 1 – December 9, 2016, 65 percent of the housing sales were below \$250,000. These sales included MLS sales as well as private sales and other transfers.

Mapping the assessed valuation of single-family housing in Minot over the past six years, allowed the observation of geo-spatial changes in housing values throughout the city to be evaluated. The 2010 map shows pre-flood valuations and the concentration of more affordable housing within or adjacent to the flood inundation area (see **Figure 3.3**). The map of assessed values in 2012 demonstrates the full impact of the flood on the City's single family housing inventory. Due to the disaster, many homes in the flood inundation area were valued below \$50,000 (see **Figure 3.4**). By 2015, the map shows new development north of downtown and additional construction of homes over \$300,000 (see **Figure 3.5**). The changes in the 2016 map are far more subtle as new housing construction slows significantly and values remain stable (see **Figure 3.6**).

In addition to the geographic perspective provided by mapping single family home values in the city, it is beneficial to see the difference in assessed valuation for single family housing in Minot from 2010 to 2016. **Figure 3.7** shows the change in assessed valuation over the past six years. It can be seen that a significant number of homes increased in value by more than \$100,000, as well as homes that increased in value from \$100,000 to \$300,000. In 2017 an adjustment in single family valuation is anticipated that may moderate increases by 15 percent. However, these significant changes in value depict housing impacts from both the flood and the oil boom.



Figure 3.3: Assessed Value of Single Family Housing (2010)

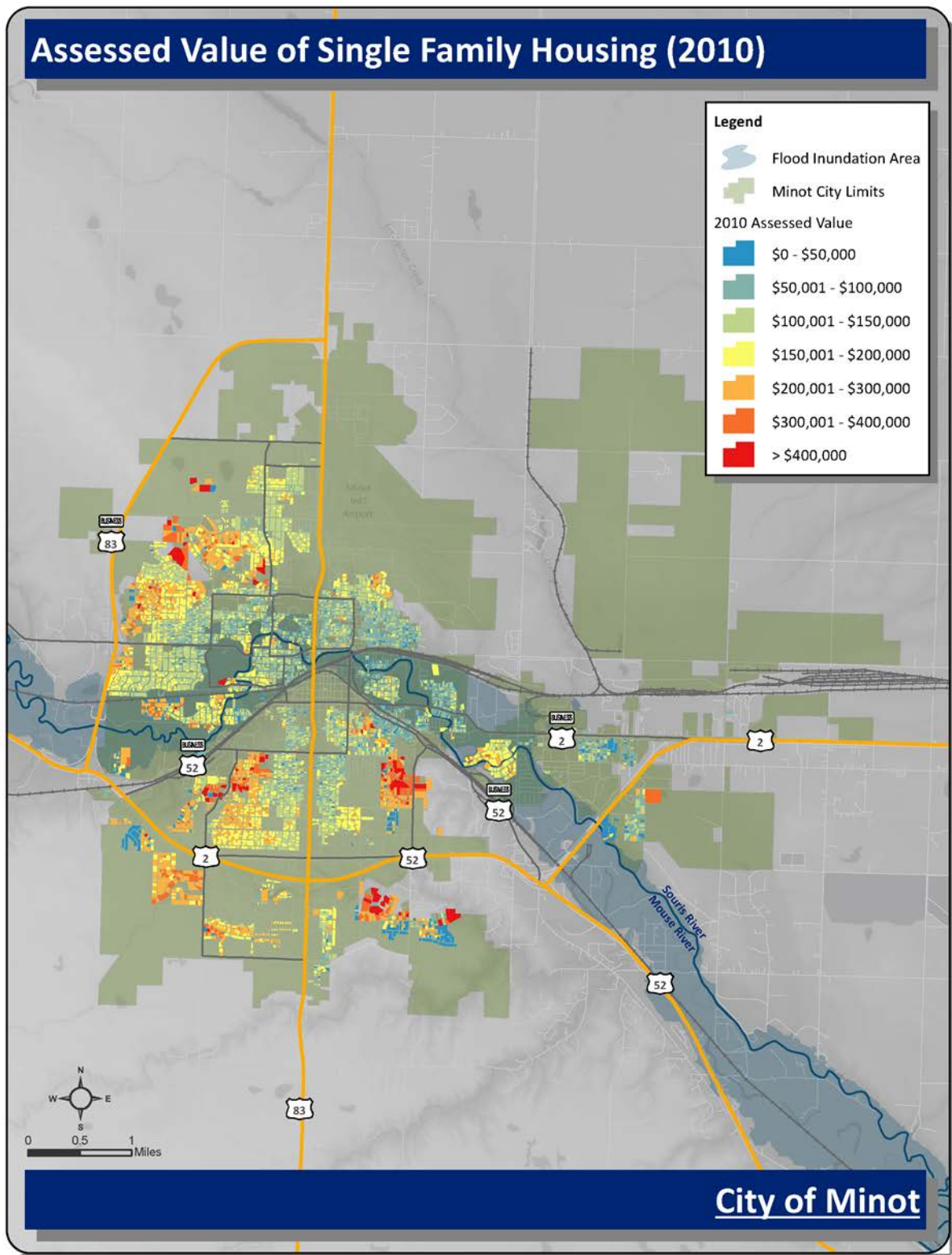


Figure 3.4: Assessed Value of Single Family Housing (2012)

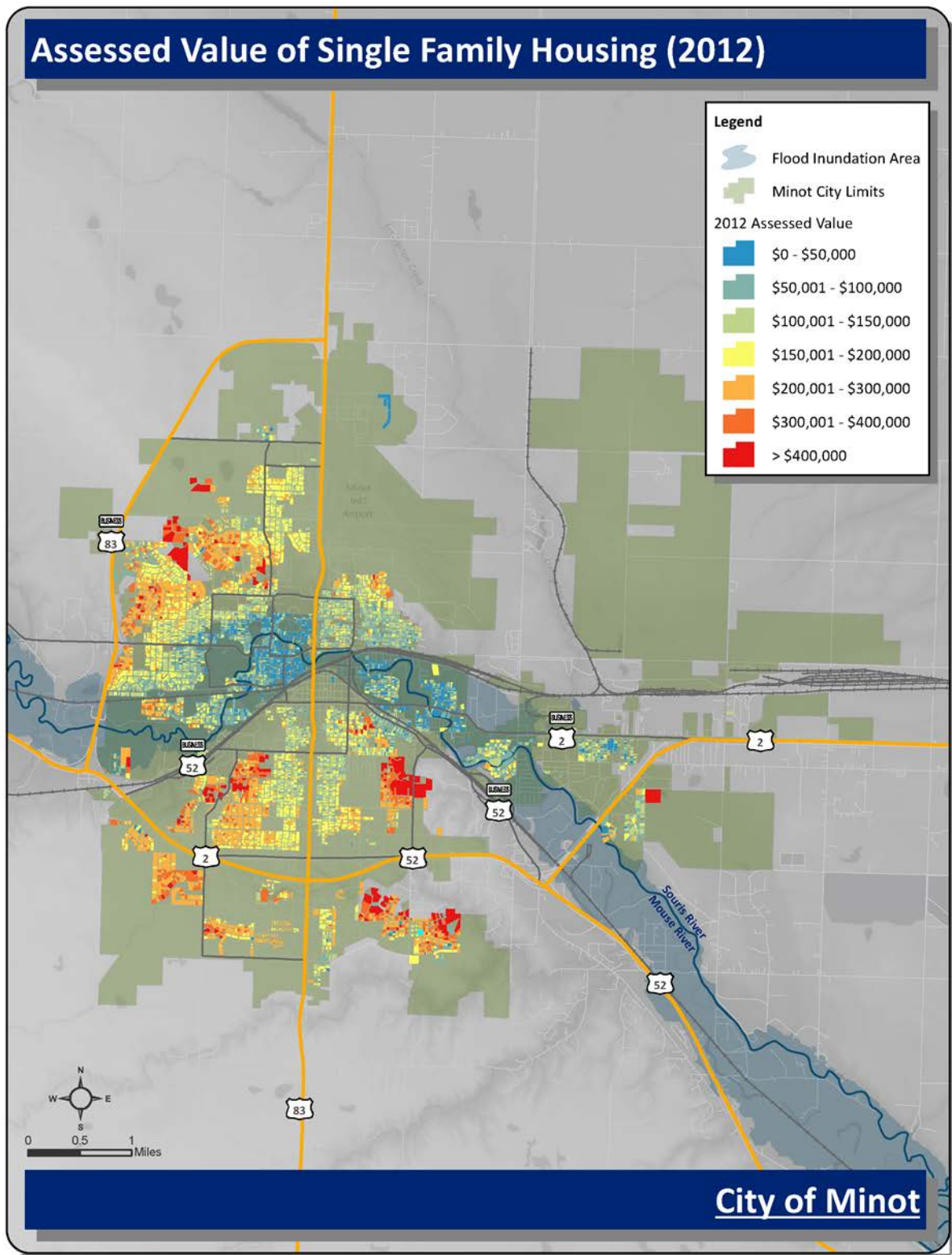




Figure 3.5: Assessed Value of Single Family Housing (2015)

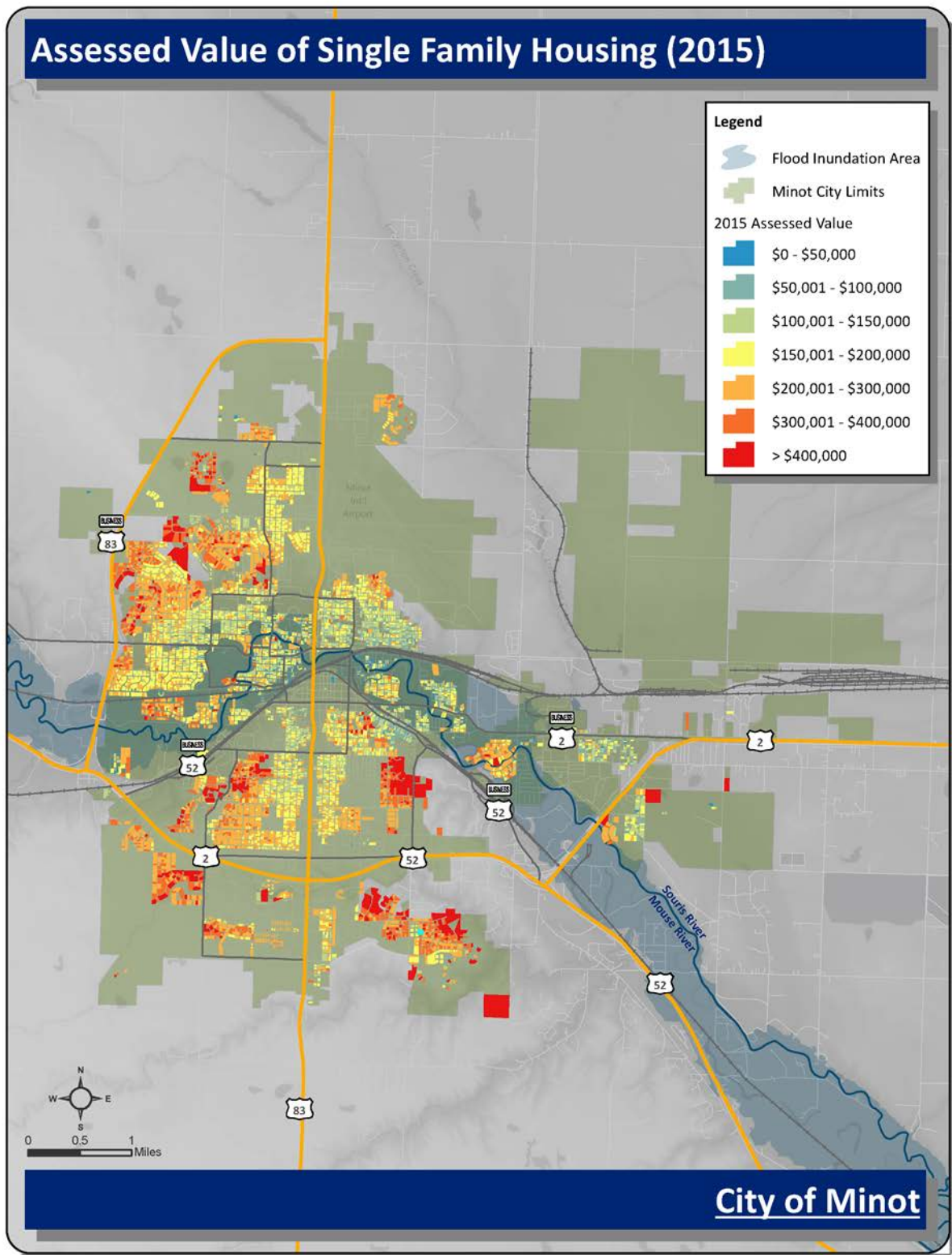




Figure 3.6: Assessed Value of Single Family Housing (2016)

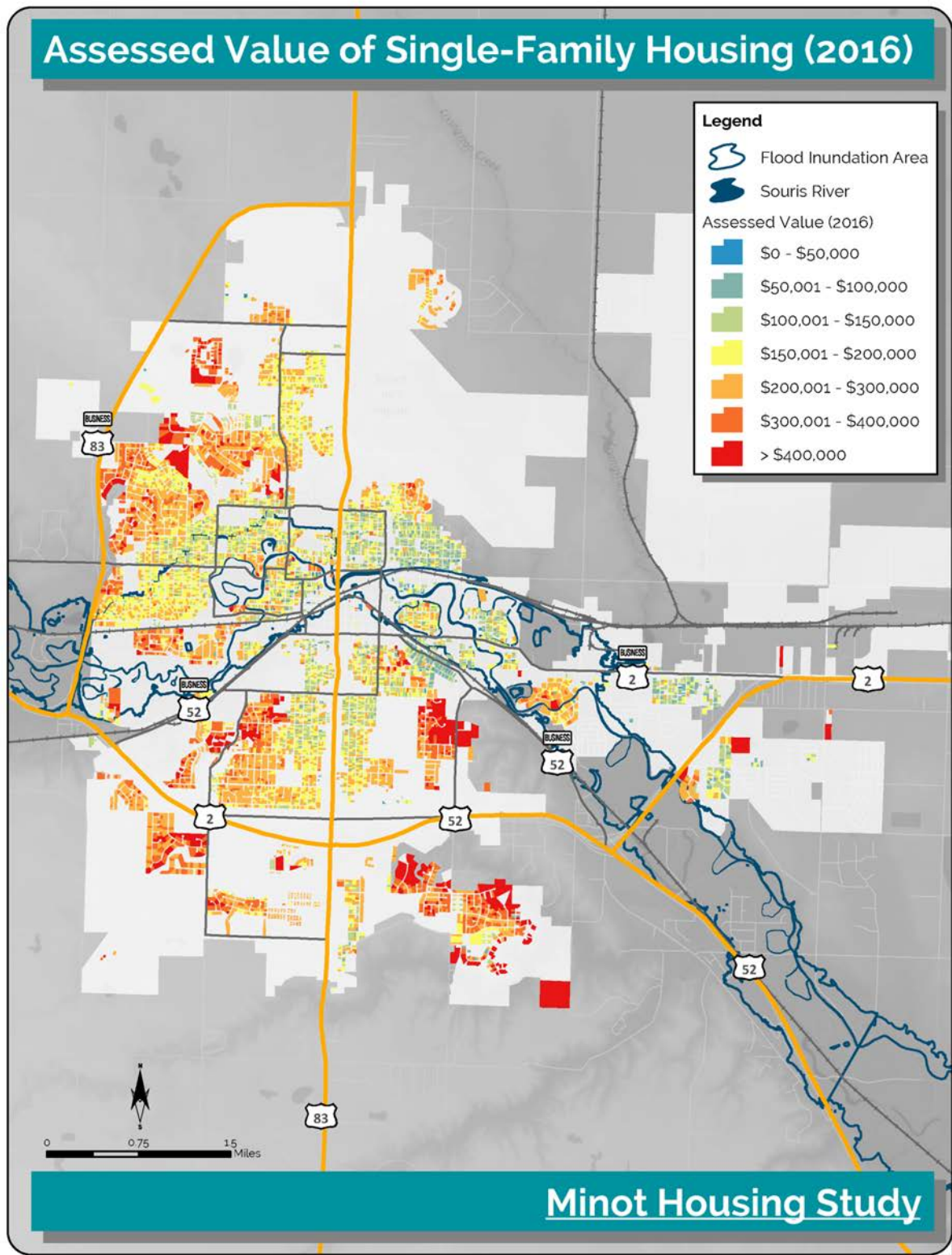
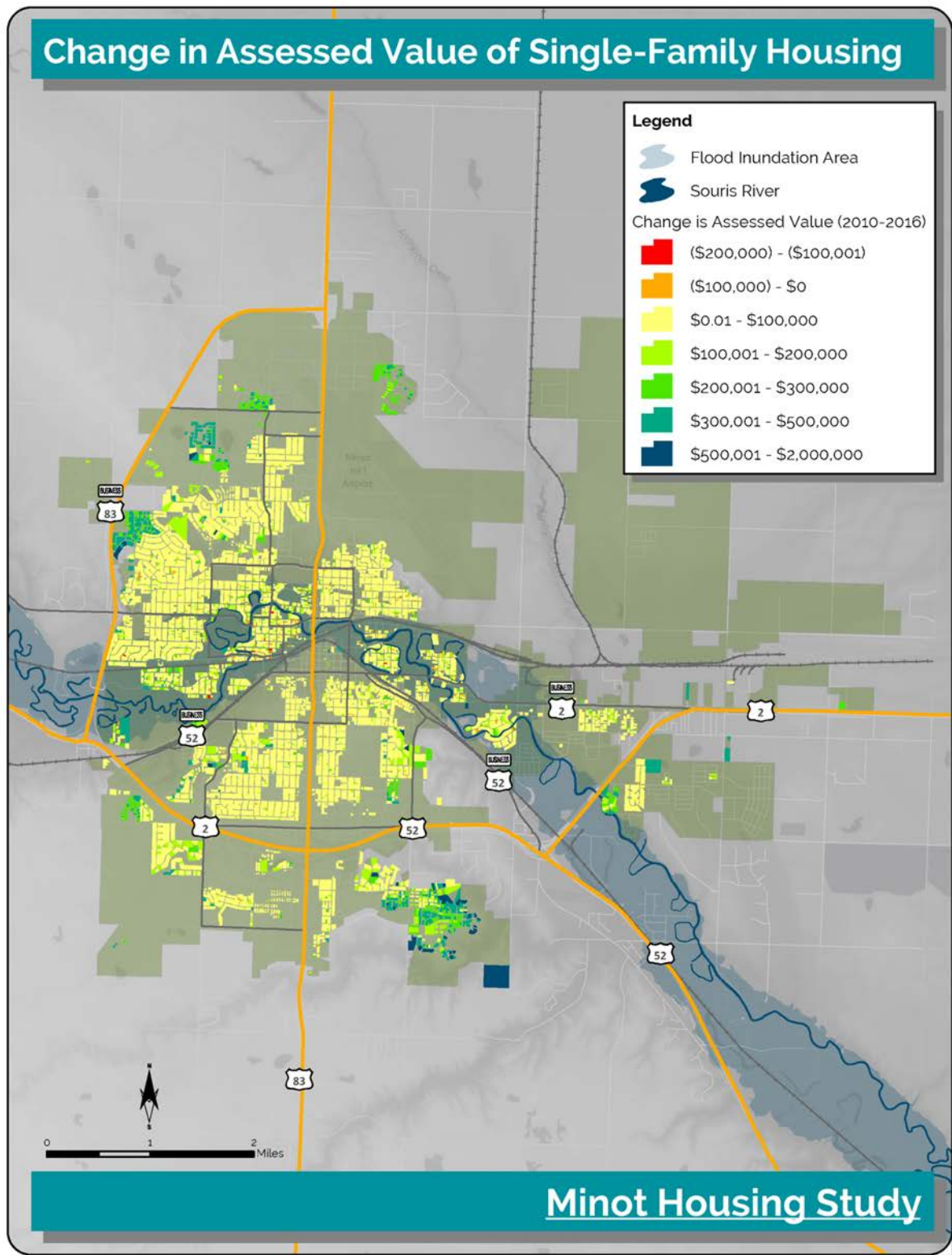


Figure 3.7: Change in Assessed Value of Single Family Housing (2010-2016)





# Section 4: The Demographic Context for Housing in Minot

*City of Minot, North Dakota*





## Section 4: THE DEMOGRAPHIC CONTEXT FOR HOUSING IN MINOT

Since 2006, oil and natural gas development has expanded rapidly in North Dakota. This expansion is a result of the successful use of hydraulic fracturing and horizontal drilling. These technologies have made it possible to recover energy deposits trapped thousands of feet beneath the surface in the Bakken Formation, one of the largest contiguous deposits of oil and natural gas in the United States. According to data from the North Dakota Department of Mineral Resources - Oil and Gas Division, in 2005, prior to the beginning of North Dakota's oil and gas boom, approximately 100,000 barrels of oil per day were produced in the state. By 2015, more than 1.2 million barrels of oil per day were produced.<sup>26</sup> Concurrently, the state's current-dollar gross state product, the counterpart to the nation's gross domestic product, grew from \$24.7 billion to \$54.8 billion (an average annual growth rate of 6.5 percent).<sup>27</sup> This remarkable growth can largely be attributed to the petroleum industry as well as a healthy agricultural sector.<sup>28</sup>

The unprecedented expansion in the petroleum industry in North Dakota has caused the state's population to soar. People have migrated to the state seeking high-paying employment opportunities found within the sector. In 1940, North Dakota's population was approximately 641,900 residents. By 2000, population had only grown to 642,200. From 2000 to 2010, population grew approximately 0.5 percent per year. However, from 2010 to 2015, population increased at an average annual rate of 2 percent. By 2015, North Dakota's population stood at approximately 756,900 people, an increase of 13 percent from 2010 and the highest in the state's history.<sup>29</sup> Statistics at the county level illustrate even more dramatic growth. In North Dakota's western counties, where oil and gas development is concentrated, counties such as Williams, Mountrail, Dunn, and Stark have experienced 20 to 60 percent population growth in the last five years. Population has more than doubled in McKenzie County.<sup>30</sup> Minot has also experienced tremendous growth, from approximately 40,900 people in 2010 to nearly 49,500 people in 2015, an increase of almost 21 percent (See **Figure 4.1**).<sup>31</sup>

**Figure 4.1** illustrates how migration due to the oil and gas boom, rather than natural increase (births minus deaths), is the driving force behind the state's recent population growth. Data available from the U.S. Census Bureau indicate more than 12,200 people, on average, migrated to North Dakota each year between 2010 and 2015. In north central North Dakota (which includes Ward County),

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<sup>26</sup> <https://www.dmr.nd.gov/oilgas/stats/historicaloilprodstats.pdf>

<sup>27</sup> U.S. Bureau of Economic Analysis

<sup>28</sup> [https://www.ndhfa.org/Publications/NDSHNA\\_2016\\_Component1.pdf](https://www.ndhfa.org/Publications/NDSHNA_2016_Component1.pdf)

<sup>29</sup> Ibid.

<sup>30</sup> U.S. Census Bureau

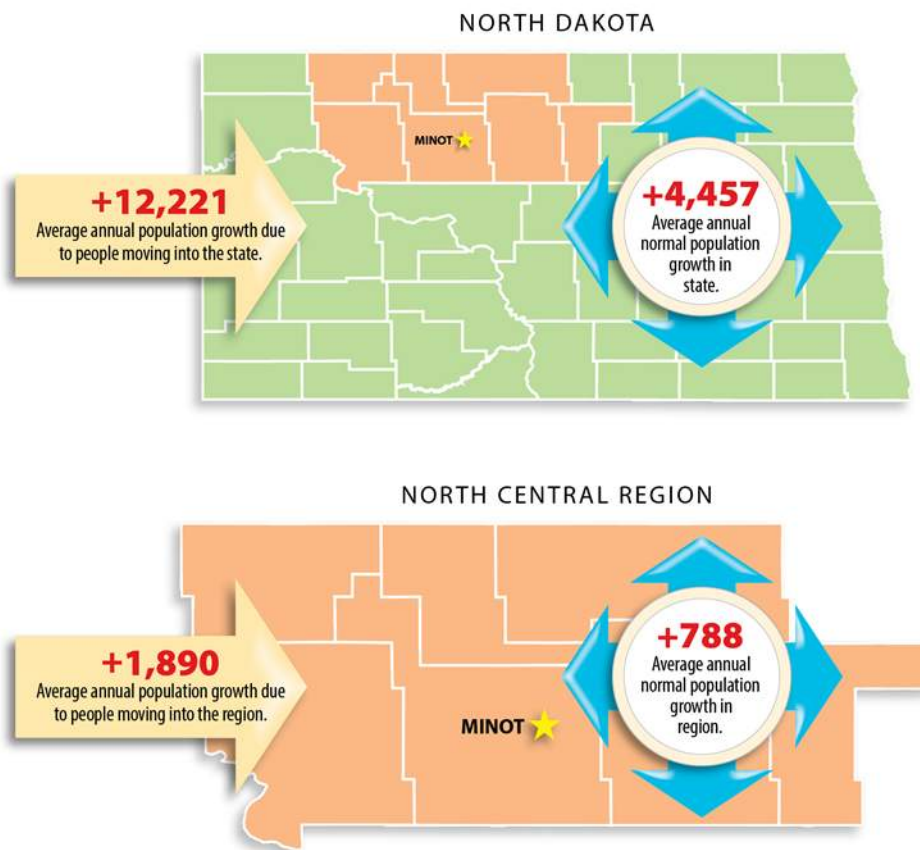
<sup>31</sup> Ibid.



nearly 1,900 people, on average, migrated to that area during the same period. This compares to natural increase growth of approximately 4,500 people statewide and nearly 800 people in the north central region.

*Figure 4.1: Drivers of Population Growth*

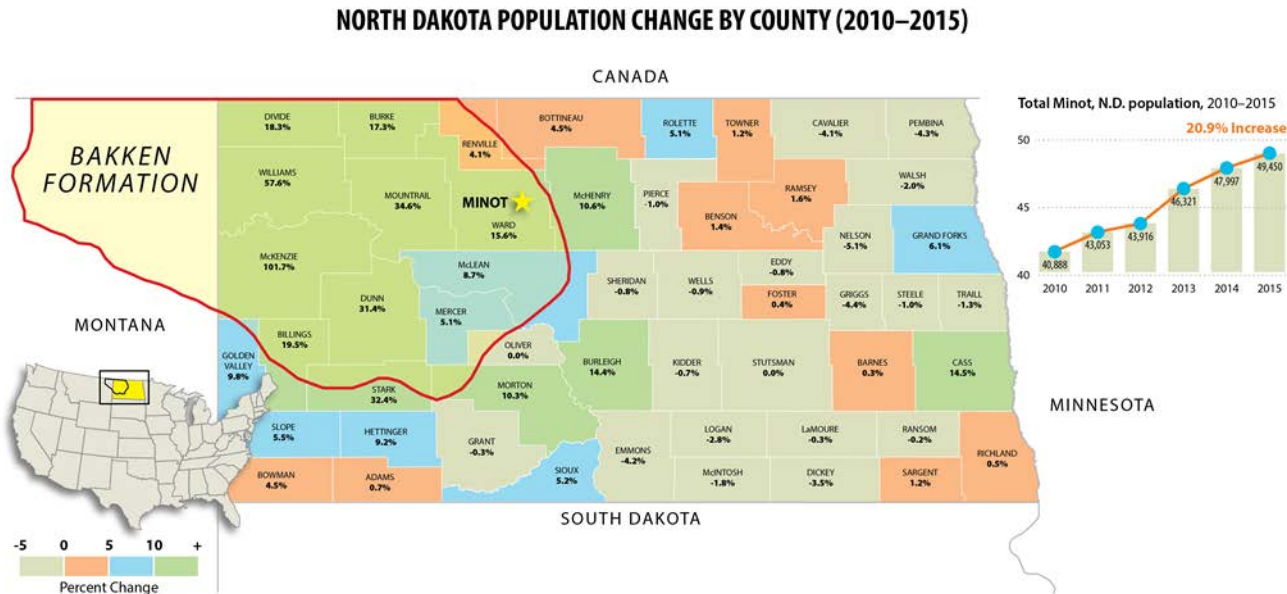
## POPULATION GROWTH IN NORTH DAKOTA AND NORTH CENTRAL REGION (2010–2015)



Source: U.S. Census Bureau

Job growth and population increase are two of the primary drivers for housing development. (See **Figure 4.2**) In 2009, along with the economic surge in northwestern North Dakota and a statewide increase in population and employment, the sale of homes and the construction of multi-family housing exceeded previous records. As oil and gas development and population skyrocketed, communities found it difficult to provide housing, goods, and services. Exacerbating the situation is the volatility of oil prices, making it especially challenging for those communities to predict future needs for housing. Although the price of oil plummeted in late 2014 and early 2015, and economic and population growth slowed compared to the 2009 to 2014 period, an increase in the price of oil will likely cause higher population growth rates to resume.

Figure 4.2: North Dakota Population Change by County



Source: U.S. Census Bureau

## 4.1 Non-Resident Workforce Population in Minot

Various population forecasts at the state, regional, county, and city level have been prepared that can aid in predicting the need for future housing, goods, and services in North Dakota's oil and gas producing counties. Two examples of the most recent forecasts include the *North Dakota Census Office Population Projections of the State, Regions, and Counties 2016*, and North Dakota State University's 2016 *North Dakota Statewide Housing Needs Assessment*.<sup>32</sup> **A significant omission from both forecasts, however, is the state's non-resident workers. This is a critical shortcoming if the forecasts are used for future planning in the state's western counties. A large number of employees in North Dakota's petroleum industry live in the state while they work but are permanent residents elsewhere. The 2016 North Dakota Statewide Housing Needs Assessment specifically acknowledges this issue by stating the following:**

*"In most areas of the state, this omission will have little effect on total population; however, high growth areas associated with oil and gas development will likely have non-resident workers which should be considered when evaluating policies associated with housing needs. While there are fewer non-resident workers present since oil and gas activity slowed in 2015, a substantial portion of the oil and gas industry workforce will continue to work in North Dakota and live elsewhere."*<sup>33</sup>

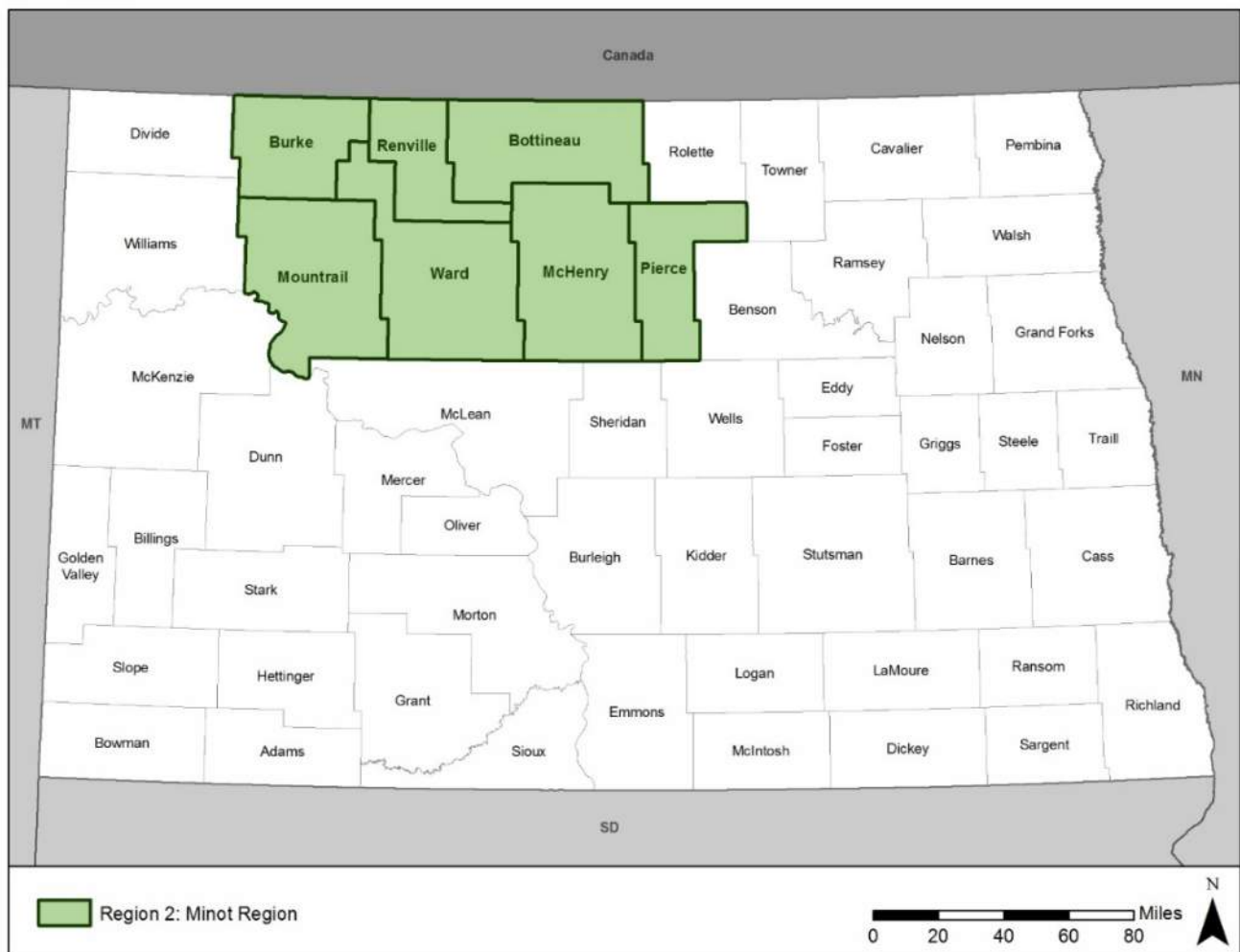
<sup>32</sup> A third forecast prepared by North Dakota State University for Vision West ND, a planning consortium of western North Dakota counties, was released during the preparation of this report. This forecast projected more conservative growth than the *North Dakota Census Office Population Projections of the State, Regions, and Counties 2016* and the 2016 *North Dakota Statewide Housing Needs Assessment*.

<sup>33</sup> [https://www.ndhfa.org/Publications/NDSHNA\\_2016\\_Component1.pdf](https://www.ndhfa.org/Publications/NDSHNA_2016_Component1.pdf), Page 24

The analysis that follows describes the population projections and development of a validated estimate for Minot's non-resident population. **Based on this analysis, Minot's population will increase by 10,844 by 2024, a 21 percent increase resulting in 4,715 new households.**

The Affordable Housing Supply and Demand Analysis conducted an economic impact analysis of the petroleum industry in the Minot region for the 2015 to 2024 period, with the specific goal of estimating non-resident oil and gas workers who work and live in the Minot region and the City of Minot but are not classified as permanent residents. By estimating the non-resident workforce, these workers can be added to the projected population for the region and the City, providing a more complete picture of the potential population that will drive the demand for housing, goods, and services. For this report, the Minot region is defined as Region 2 within North Dakota's group of eight designated state planning regions, and includes Bottineau, Burke, McHenry, Mountrail, Pierce, Renville, and Ward counties. (See **Figure 4.3**)

*Figure 4.3: Counties Comprising the Minot Region*



Source: CDM Smith

## 4.2 Population Projections for Minot

This section presents the recent population projections prepared by the North Dakota Census Office and NDSU. A comparison of the projections at the regional level is provided, followed by the selection of preferred population projections for the Minot region and the City of Minot. These projections are used in the economic impact analysis of the Minot region's petroleum industry.

### 4.2.1 North Dakota Census Office Population Projections

In January 2016, the North Dakota Census Office released the *North Dakota Census Office Population Projections of the State, Regions, and Counties 2016*. The forecasts in this document were prepared using high, expected, and low rates of migration between 2015 and 2040. **Table 4.1** presents the North Dakota Census Office's forecasts for the state, the Minot region (Region 2), and Ward County (no projection for the City of Minot was conducted). As shown in **Table 4.1**, statewide population is projected to grow at an average annual growth rate (AAGR) of 1.1 percent in the expected migration scenario, 1.4 percent in the high migration scenario, and 0.8 percent in the low migration scenario. For the Minot region, population is forecast to increase at an AAGR of 1.3 percent in the expected migration scenario, 1.6 percent in the high migration scenario, and 1.0 percent in the low migration scenario. Ward County is projected to grow at 1.3 percent, 1.7 percent, and 1.0 percent in the expected, high, and low migration scenarios, respectively.

**Table 4.1: North Dakota Census Office Population Projections**

North Dakota, the Minot Region, and Ward County

	2015	2020	2025	2030	2035	2040	AAGR 2015- 2040
<b>NORTH DAKOTA</b>							
Expected Migration Scenario	756,927	824,344	884,874	931,506	966,375	991,522	1.1%
High Migration Scenario	756,927	848,563	925,164	984,147	1,027,760	1,059,672	1.4%
Low Migration Scenario	756,927	800,124	844,583	878,865	904,990	923,372	0.8%
<b>MINOT REGION (REGION 2)</b>							
Expected Migration Scenario	103,736	114,796	124,823	132,542	138,505	143,189	1.3%
High Migration Scenario	103,736	118,550	131,434	141,361	148,967	154,959	1.6%
Low Migration Scenario	103,736	111,041	118,213	123,724	128,043	131,418	1.0%
<b>WARD COUNTY</b>							
Expected Migration Scenario	71,243	79,053	86,157	91,644	96,037	99,607	1.3%
High Migration Scenario	71,243	81,383	90,306	97,293	102,846	107,385	1.7%
Low Migration Scenario	71,243	76,724	82,009	85,996	89,229	91,829	1.0%

Source: North Dakota Census Office Population Projections of the State, Regions, and Counties 2016, prepared by the North Dakota Census Office



### 4.2.2 North Dakota State University Population Projections

Population forecasts prepared by NDSU in its report 2016 *North Dakota Statewide Housing Needs Assessment* are presented in **Table 4.2**. NDSU's forecasts projected population for the years 2019, 2024, and 2029. No high- or low-growth projections were included. As shown in the table, population for the state, the Minot region, and the City of Minot are all projected to increase at an AAGR of 1.3 percent during the 2014 to 2029 period. Ward County is anticipated to grow at a faster rate of 1.5 percent.

**Table 4.2: North Dakota State University Population Projections**

North Dakota, the Minot Region, Ward County, and the City of Minot

	2014	2019	2024	2029	AAGR 2014-2029
North Dakota	739,482	813,282	852,615	891,268	1.3%
Minot Region	101,040	113,296	118,606	122,949	1.3%
Ward County	69,384	79,282	83,283	86,796	1.5%
City of Minot	47,999	53,654	56,306	58,585	1.3%

Source: 2016 *North Dakota Statewide Housing Needs Assessment*, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University

### 4.2.3 Comparison of the Population Projections

**Table 4.3** presents the North Dakota Census Office and NDSU population forecasts for the Minot region for the 2015 to 2024 period, which is the focus of this report.<sup>34</sup> In the North Dakota Census Office forecast, the region's population is projected to grow at AAGRs ranging from 1.3 percent (low migration scenario) to 2.4 percent (high migration scenario) between 2015 and 2024. Population is projected to grow at an AAGR of 1.5 percent during the same period in the NDSU forecast.

**Figure 4.4** graphically compares the North Dakota Census Office and NDSU population forecasts for the Minot region. As the figure illustrates, the North Dakota Census Office's high and low migration scenarios represent the upper and lower limits of the forecast range. The North Dakota Census Office's expected migration scenario and NDSU's forecast represent the mid-range forecasts.

<sup>34</sup> The North Dakota Census Office's population figures for 2016 to 2019 and 2024 were interpolated. For the NDSU forecast, population figures for 2015 to 2018 and 2020 to 2023 were interpolated. Neither forecast provided figures for these respective years.

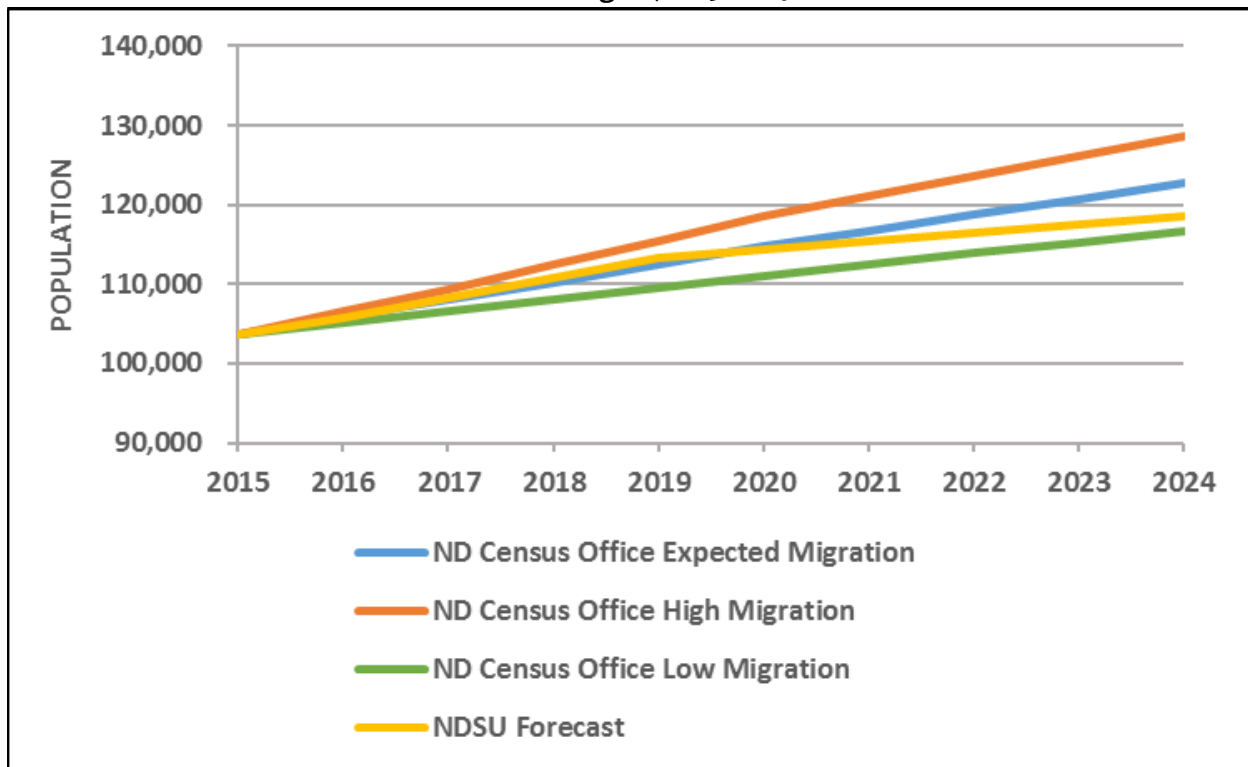
**Table 4.3: North Dakota Census Office and North Dakota State University Population Projections for the Minot Region, 2015-2024**

	2015	2016	2017	2018	2019	2024	AAGR 2015- 2019	AAGR 2015- 2024
<b>NORTH DAKOTA CENSUS OFFICE FORECAST</b>								
Expected Migration Scenario	103,736	105,859	108,026	110,237	112,493	122,750	2.0%	1.9%
High Migration Scenario	103,736	106,543	109,425	112,386	115,427	128,750	2.7%	2.4%
Low Migration Scenario	103,736	105,158	106,598	108,059	109,540	116,742	1.4%	1.3%
<b>NORTH DAKOTA STATE UNIVERSITY FORECAST</b>								
Minot Region	103,380	105,775	108,225	110,731	113,296	118,606	2.3%	1.5%

Note: North Dakota Census Office population figures for 2016 to 2019 and 2024 were interpolated. NDSU figures for 2015 to 2018 were interpolated.

Source: North Dakota Census Office Population Projections of the State, Regions, and Counties 2016, prepared by the North Dakota Census Office and 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University

**Figure 4.4: North Dakota Census Office and North Dakota State University Population Projection Comparison  
Minot Region, 2015-2024**



Source: North Dakota Census Office Population Projections of the State, Regions, and Counties 2016, prepared by the North Dakota Census Office and 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University

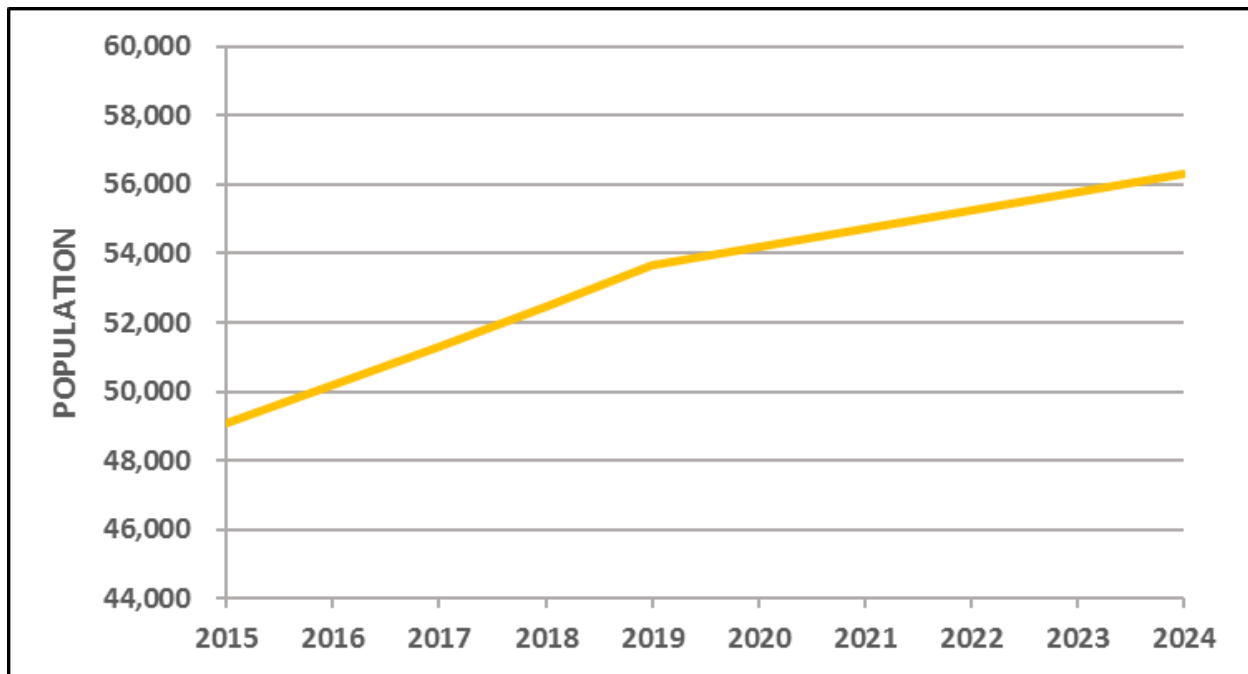
In the case of the City of Minot's future population, only NDSU's forecast provided a projection, so no comparison with a North Dakota Census Office projection is possible. **Table 4.4** shows NDSU's population projection for the City of Minot for the 2015 to 2024 period.<sup>35</sup> The City's population is projected to grow at an AAGR of 2.3 percent during the 2015 to 2019 period and an AAGR of 1.5 percent during the 2015 to 2024 period. **Figure 4.5** graphically illustrates the City's forecast growth.

*Table 4.4: North Dakota State University Population Projection for the City of Minot, 2015-2024*

	2015	2016	2017	2018	2019	2024	AAGR 2015-2019	AAGR 2015-2024
City of Minot	49,080	50,186	51,316	52,472	53,654	56,306	2.3%	1.5%

Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University

*Figure 4.5: North Dakota State University Population Projection for the City of Minot, 2015-2024*



Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University

#### 4.2.4 Preferred Population Projections

NDSU's population forecasts for the Minot region and the City of Minot are selected as the preferred projections for use in this report's economic impact analysis of the Minot region's petroleum industry. These projections are selected for the following reasons:

<sup>35</sup> NDSU's population figures for 2015 to 2018 and 2020 to 2023 were interpolated, since NDSU's forecast did not provide figures for these years.

- The goal of the economic impact analysis of the petroleum industry is to estimate the non-resident oil and gas workers who work in the Minot region and the City of Minot during the 2015 to 2024 period. Therefore, population projections for both the region and the City are required. The NDSU forecast provides population projections for both levels of geography, whereas the North Dakota Census Office's projections only go as far as the county level.
- NDSU's projection for the Minot region falls between the high and low migration scenarios in the North Dakota Census Office's projections 2015 to 2019 before becoming slightly more conservative between 2020 and 2024.
- It is desirable to use a consistent data source (i.e., NDSU) for both preferred population projections.

**Table 4.5** presents the preferred population projections used in the economic impact analysis of the Minot region's petroleum industry that follows.

*Table 4.5: Preferred Population Projections for the Minot Region and the City of Minot, 2015-2024*

	2015	2016	2017	2018	2019	2024	AAGR 2015-2019	AAGR 2015-2024
Minot Region	103,380	105,775	108,225	110,731	113,296	118,606	2.3%	1.5%
City of Minot	49,080	50,186	51,316	52,472	53,654	56,306	2.3%	1.5%

*Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University*

### 4.3 Impacts of Non-Resident Workers on Minot's Population

To assist with future planning in oil and gas producing counties, this report estimates the economic impacts of the petroleum industry in the Minot, North Dakota region for the 2015 to 2024 period. As explained previously, the objective is to assess the petroleum industry's potential impact on the future population of the region and the City by providing a breakout of the economic impacts supported by the industry's non-resident workforce. In turn, these non-resident worker employment impacts are added to the preferred population projections. The total economic impact of the petroleum industry in the Minot region is quantified in terms of employment, payroll, and output. Output represents total spending or economic activity and accounts for the total value of petroleum industry activities. This report presents the economic impacts of the petroleum industry in the Minot region in terms of the following categories:

- Oil and gas drilling, extraction, and production;
- Infrastructure development;
- Professional services;
- Transportation; and
- Wholesale trade and manufacturing.

Minot's future housing needs will be driven by population growth that is largely determined by economic development activity resulting in new or expanded employment opportunities. Economic development results from the retention or expansion of existing businesses in the community or the location of firms and successful entrepreneurial ventures. Historically population has followed job growth, as evidenced by the recent spike during the recent oil boom. The demand for housing is

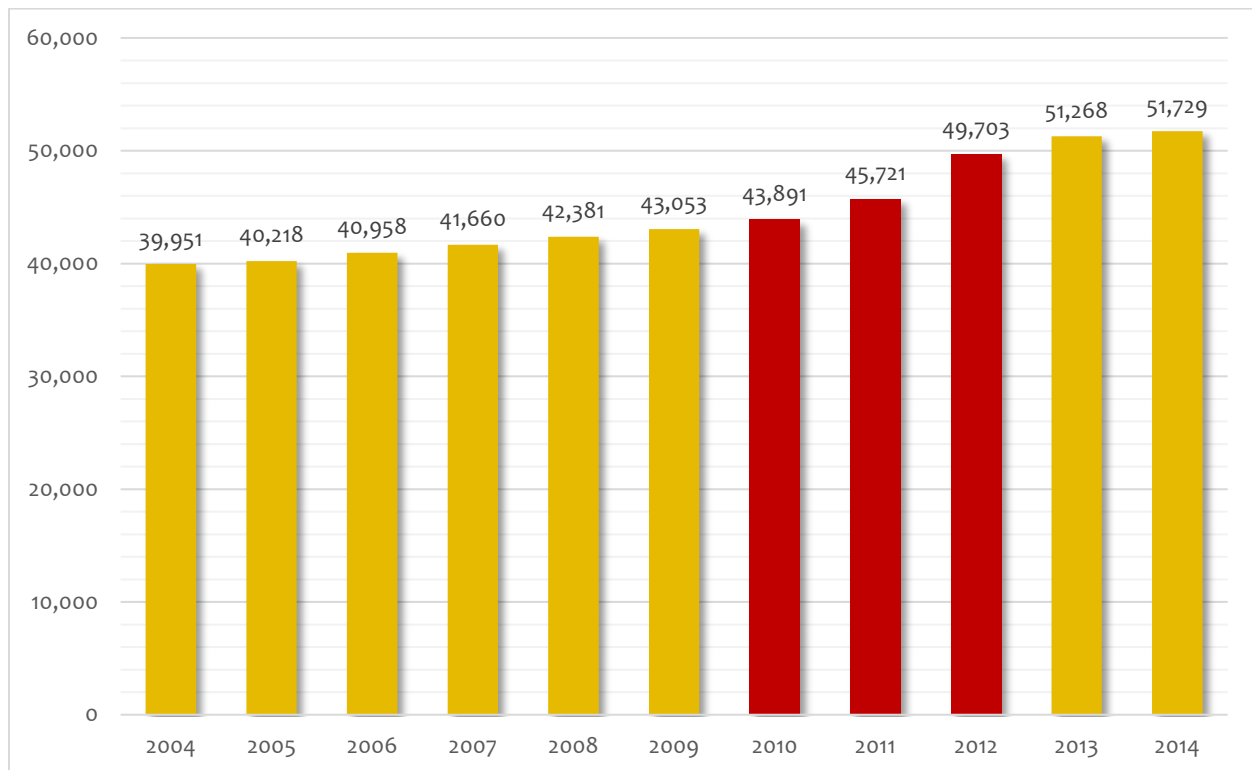


generally determined by wage rates in dominate industry sectors, employment growth trends, and location of employment concentrations. As discussed in previous sections and explored further in Section 6, as a regional trading center, Minot's employment is primarily concentrated in services, trade, health care, and food services and accommodations. Employment in the oil sector remains cyclical in the region depending in large measure on the barrel price of oil.

### 4.3.1 Employment and Income

Minot/Ward County has a diverse employment base supporting the local economy and serves as a regional center for west central North Dakota. Ward County has a long history of steady employment and population growth (see **Figure 4.6**). The fastest employment growth occurred between 2010 and 2012 when the County experienced a 13 percent jump in employment, equating to nearly 5,900 additional jobs. Since 2012, employment has returned to a slow but steady growth in the county.

*Figure 4.6: Ward County Employment*



Source: Bureau of Economic Analysis 2014

The Minot Area Chamber of Commerce publishes their *Economy at a Glance* report monthly based on Job Service North Dakota data. As of September 2016, the unemployment rate for Ward County and Minot was 3.2 percent and 3.3 percent, respectively. These unemployment rates are above the state average of 2.4 percent but are performing better than the national average of 4.8 percent.

The top employment jobs in Ward County by industry sector are shown in **Table 4.6**. Retail Trade leads the way with nearly 6,000 jobs followed by Health Care, Accommodation and Food Services, Education, and Construction to round out the top five employment sectors.

*Table 4.6: Ward County Industry Employment Distribution*

Rank	Industry Sector	Establishments	Employees
1	Retail Trade	302	5,965
2	Health Care and Social Assistance	181	4,795
3	Accommodation and Food Services	190	3,935
4	Educational Services	33	3,107
5	Construction	362	2,679
6	Wholesale Trade	167	1,956
7	Transportation and Warehousing	195	1,659
8	Public Administration	43	1,616
9	Finance and Insurance	152	1,329
10	Other Services (except Public Administration)	174	1,261

*The table shows the distribution of industries in Ward County, North Dakota for the 4th quarter, 2015.*

*Source: Labor Market Information Center, Job Service North Dakota, 2014*

Driven by the in-migration of gas and oil field workers and limited workforce availability in other sectors, as many workers chose to take higher paying oil jobs, the average household income in Minot increased from 2010 to 2014. The 2014 average and entry level salary for select occupations in west central North Dakota are shown in **Table 4.7**.

*Table 4.7: Select 2014 Entry Level and Average Salaries in West Central North Dakota*

Occupation	Entry Level Salary	Average Salary
Secondary School Teachers	\$35,590	\$49,690
Registered Nurses	\$41,020	\$58,140
Police and Sheriff's Officers	\$31,360	\$44,040
Cashiers	\$17,400	\$24,360
Nursing Assistants	\$21,890	\$28,510

*Source: Bureau of Labor Statistics*

Much of Minot's future population growth will be driven by employment opportunities resulting from the continued expansion of local industries, new firms attracted to the area, oil and gas production, and successful entrepreneurial ventures. An IMPLAN economic model was developed to assess population growth and non-resident workers in the area.<sup>36</sup> The detailed methodology and data tables documenting the results of this analysis are presented in **Appendix A** of this report. Based on the North Dakota Department of Mineral Resources – Oil and Gas Divisions projections, direct employment in the petroleum industry in the Minot region is projected to increase from nearly 7,700 employees in 2015 to approximately 17,400 employees in 2024, an average annual growth rate of 9.5 percent. This includes employment growth in several sectors directly impacted by oil industry

<sup>36</sup> Total employment in 2015 within NAICS codes was obtained from the corresponding Area Profile published by JSND,

growth: infrastructure development, professional services, transportation, and wholesale trade and manufacturing. The direct impacts supported by oil and gas production in 2015 included nearly 3,200 jobs earning more than \$401.5 million in annual payroll, with an annual output of more than \$7.9 billion.<sup>37</sup>

The study team supplemented this analysis with a location quotient analysis to identify key local employment concentrations.



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<sup>37</sup> IMPLAN multipliers and CDM Smith.



# Section 5: Analyzing Housing Demand and Affordable Housing Needs

*City of Minot, North Dakota*







## Section 5: ANALYZING HOUSING DEMAND AND AFFORDABLE HOUSING NEEDS

This analysis is based on the current housing market and conditions in Minot, patterns of affordability, and projections of the community's future affordable housing needs through 2024. Future affordable housing needs are based on an analysis of population forecasts (including an analysis of the non-resident workforce), socioeconomic characteristics, and recognition that the oil industry has a significant impact on Minot's economy and housing. Understanding these factors is essential to evaluating the future demand for affordable housing in Minot, the role the National Disaster Resilience funding can play in helping to meet that need, and developing recommendations for policies and tools that support more positive outcomes for both market-rate multifamily and long-term affordable housing.

### 5.1 What is Affordable Housing and Why does it Matter to Minot?

There are nationally accepted guidelines for determining the affordability of housing. Whether for renters or homeowners, affordability is defined as “the amount an average household can afford, based on 30 percent of their total income”.<sup>38</sup> Based on this definition, a household spending 30 percent or less of their income on housing has “affordable housing,” while a household spending more than 30 percent of their income on housing is considered “cost burdened” for housing. Those in cost burdened housing are often challenged to afford basic necessities including food, medical care, transportation, and clothing. This definition is used by the U.S. Department of Housing and Urban Development and by the North Dakota Housing Finance Agency for their housing programs.

The availability of housing affordable to residents earning a range of incomes, helps support a more resilient and diversified economy. Businesses who may want to expand their operations in Minot, and new companies evaluating locations for new facilities, carefully evaluate housing costs and availability to ensure their employees could afford to live in chosen communities. Many entry-level employees, those who work in some service and health businesses, and even some essential public service employees earn wages that do not allow them to afford many housing options in Minot today. Based on FY 2015 income data from the U.S. Census, 17 percent of families in Minot earn less than \$24,300 per year (which is 30 percent of the area median income); 6.4 percent earn \$24,301 to \$36,750 annually (31 percent to 50 percent of area median income); and 16 percent earn less than \$58,800 (51 percent to 80 percent of area median income).<sup>39</sup> Families with incomes below 80 percent of the area median income often experience real challenges finding affordable housing options.

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<sup>38</sup> U.S. Department of Housing and Urban Development, Housing Affordability Guidance, Community Planning and Development

<sup>39</sup> U.S. Census, American Community Survey data 2015, based on a family of 4. This is the most current dataset available.

## 5.2 Minot's Economy, Labor Market and Affordable Housing

A range of skills and people are needed to keep Minot's economy functioning. Some occupations the community relies upon pay lower wages meaning lower annual incomes for those families. A review of employment concentrations in Ward County and the North Central North Dakota Region found that over 57.3 percent of those employed in Minot were employed in construction, retail trade, health care, and accommodations and food services. Many jobs in these sectors provide lower or more moderate wages. Employees in other jobs such as child care, senior care, wholesale trade, maintenance, and transportation often earn lower or moderate wages as well.

Finding affordable housing for families with low and/or moderate incomes can be challenging. In many business sectors housing costs in Minot have risen faster than incomes. "The value of owner-occupied housing units in North Dakota has increased 31.5 percent since 2010."<sup>40</sup> In comparison, Minot single family housing costs increased by nearly 64 percent from 2008 to 2016.

The area inundated by the 2011 flood provided the highest percentage of the city's affordable housing stock at that time. Many of the new housing units built after the flood, as well as the homes that were renovated, have significantly higher values than housing previously located near the Souris River. These newer homes provide higher quality finishes and amenities than the homes damaged by the flood. Although housing costs have moderated with the decline in oil production in northwestern North Dakota, 40 percent of renter households and 22 percent of homeowners in Minot remain cost burdened for housing. This is due, in part, to the loss of some most affordable housing in Minot as a result of the flood. However, it is also due to:

- lower wage growth across many business sectors nationally and in Minot;
- higher employment concentrations in the service, health care, and trade sectors; and
- inadequate funding to address all the affordable housing needs.

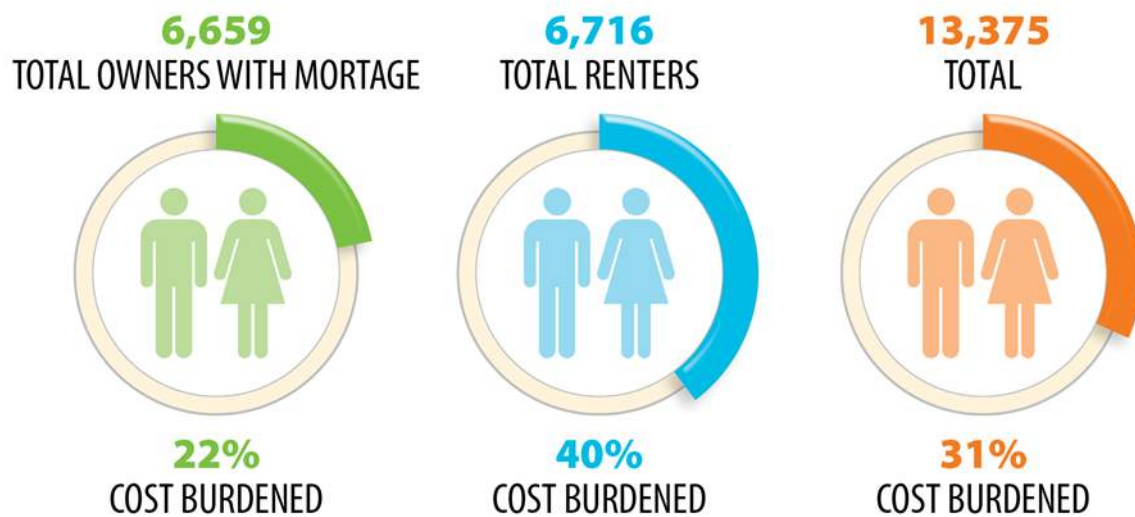
The city made significant investments in renovation and development of long-term affordable housing using Disaster Recovery funds. However, funding was inadequate to address all affordable housing needs, as well as other essential infrastructure needs requiring major investments, to support the City's recovery.

Providing sufficient affordable housing for a range of income levels is important to achieving Minot's full economic development potential. Many of the workers in lower-wage jobs across a range of business sectors form the backbone of the region's economy. These workers provide goods and services essential to residents and businesses, support key business functions and public services, and serve the visitors that come to Minot every year to shop, enjoy events, and receive vital health care services. Without an adequate supply of long-term affordable housing for these employees, it will be increasingly challenging to attract and retain the workforce needed to grow and sustain a resilient and vibrant local economy. During the recent oil boom, those who lived here will remember "Help Wanted" signs on almost every business. Companies were forced to pay higher and higher wages to compete for employees just to stay open, sometimes to their own detriment.

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<sup>40</sup> U.S. Census Bureau, 2014 American Community Survey, 1-Year Estimates

## PERCENT OF HOUSING COST-BURDENED HOUSEHOLDS



The fundamental demand driver for housing is population and job creation, with economic conditions in a secondary role. The oil industry is a volatile industrial sector; the price of oil can bolster job growth in shale oil regions. Subsequently a change in price can drive a decline in jobs as well. A study by the International Monetary Fund found a single drill rig creates 37 jobs in the near term and, over time, an additional 224 indirect and induced jobs are created in other business sectors. Given the indirect employment impacts for a single drill rig, it is easy to see why the cycles in the price of oil have such a broad effect on the northwestern North Dakota and Minot economy. As discussed previously in this report, the surge in employment when oil prices rise creates new housing demand and when prices fall there is often significant job loss and rapidly declining housing demand. In 2013, Jack Dalrymple, former Governor of North Dakota, referred to housing supply as “a great challenge facing the state.”<sup>41</sup> As an example, from October 2014 to October 2015 single family housing starts in North Dakota declined over 60 percent.<sup>42</sup>

An analysis of Ward County employment in the mining, quarrying, and oil and gas extraction sector demonstrates the direct employment volatility in this sector.<sup>43</sup> (See **Table 5.1**)

<sup>41</sup> “Sale Oil Boom and Bust: Implications for the Mortgage Market”, Federal Housing Finance Agency Office of Inspector General, September 2016.

<sup>42</sup> Federal Housing Finance Agency House Price Database, 2015

<sup>43</sup> US Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages, 2010 - 2015

*Table 5.1: Percentage of Employment in Mining, Quarrying, & Oil and Gas Extraction in Ward County*

Year	Percent Employment
2010	2.44%
2012	5.5%
2013	5.77%
2014	6.62%
2015	5.55%

Minot's employment base is concentrated in trade and service businesses. As the regional trading center for northwestern North Dakota, Minot has higher employment concentrations in retail and wholesale trade; health care; warehousing; and accommodations and food service. These jobs are vital as people throughout the region and Canada travel to Minot to buy goods and services where they generally find a wider selection at more competitive prices. **Table 5.2** compares the percentage of jobs in the primary employment sectors in Minot with those same sectors statewide and nationally. The table also contains a comparison of regional trading sectors and the manufacturing, mining, and construction sectors in Minot compared to North Dakota and the U.S.

*Table 5.2: 2015 Percentage of Employment by NAICS*

Sector	Minot/Ward County	North Dakota	United States
Mining, quarrying, oil & gas extraction	5.55%	6.32%	0.64%
Construction	9.07%	9.27%	5.43%
Retail Trade	19.61%	13.82%	13.22%
Health care & social assistance	15.21%	15.46%	15.53%
Accommodations & Food Service	13.42%	9.84%	10.94%
Manufacturing	2.01%	6.92%	10.39%
Wholesale Trade	6.85%	7.26%	4.97%
Transportation & Warehousing	5.85%	5.55%	3.89%
Regional Trading Sectors	45.73%	36.47%	33.02%

*U.S. Department of Labor, Bureau of Labor Statistics, 2015*

Employment growth in these sectors, particularly trade sector businesses within the northwest region, is directly related to the larger region's population growth. A recent study prepared by the NDSU Center for Social Research and the Department of Agribusiness and Applied Economics provides valuable regional population analysis.<sup>44</sup> The assessment evaluates population shifts, economic changes, and housing trends on a statewide level and in eight regions. The Souris Basin Region contains Ward County and six other regional counties: Burke, Renville, Bottineau, Mountrail, McHenry, and Pierce. The population of this region is projected to increase from 101,040 in 2014 to 118,606 in 2024, a 17 percent increase.

<sup>44</sup> 2016 North Dakota Statewide Housing Needs Assessment: Component 1 – Population & Housing Forecast, North Dakota State University, 2016



Estimated employment growth from 2014 to 2024 within the major industry sectors in Minot is shown in **Table 5.3**. Outside of the oil industry, many primary occupations in Minot offer low entry level and median hourly wage rates for positions such as retail sales clerks, drivers, distribution and warehouse stock management, waiter/waitresses, and health care technicians.

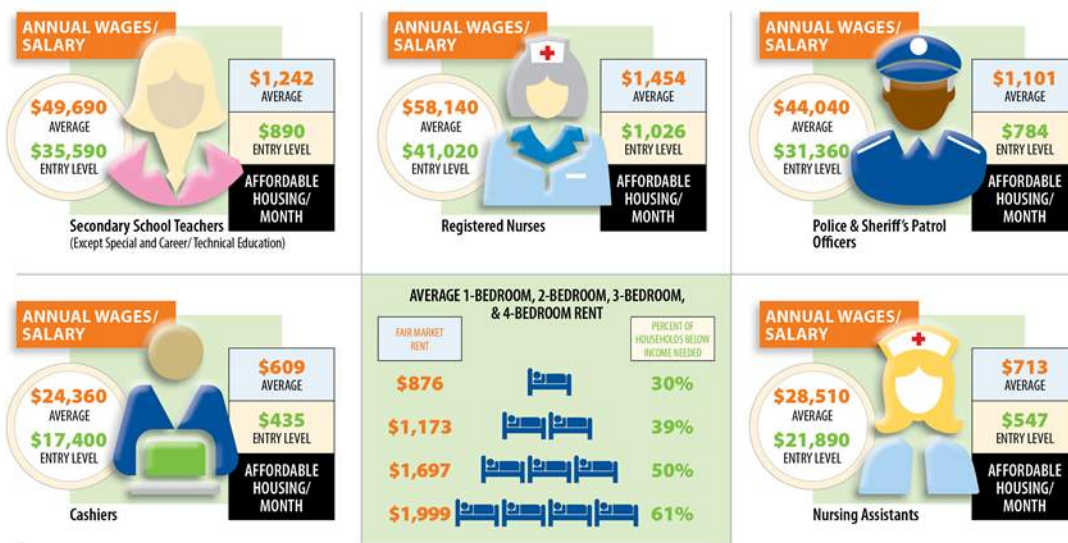
*Table 5.3: Employment Projections 2014 – 2024 and Average Hourly Wages by Major Industry Sectors*

Industry Sector	Projected Increase in Employment	North Central ND Average Hourly Wages 2016	North Central ND Average Annual Income
Construction	4.3%	\$15.44	\$32,115
Retail Trade	10.1%	\$9.25	\$19,240
Health Care & Social Assistance	13.6%	\$10.95	\$22,776
Accommodations and Food Service	9.8%	\$8.15	\$16,952
Wholesale Trade	3.8%	Not available	Not available
Transportation and Warehousing	3.0%	Not available	Not available

U.S. Department of Labor, Bureau of Labor Statistics, December 2015 and Job Services ND, North Central Region of North Dakota, ND 2016 average hourly wages.

An entry level school teacher in Minot earns \$39,250 a year and emergency service personnel (police, fire, EMT's) have an average monthly salary from \$3,724 to \$5,528. The 2016 area median income for Ward County is \$73,200. HUD defines “low income” as 80 percent of area median income (AMI), persons or households with incomes less than 50 percent of AMI qualify as “very low income” and persons or households with incomes below 30 percent of AMI qualify as “extremely low income.”<sup>45</sup> In Minot this means that a single person with an annual gross income less than \$41,200 qualifies as “low income.”

#### AFFORDABLE HOUSING COSTS OF THE MINOT WORKER



<sup>45</sup> U.S. Department of Housing and Urban Development, FY 2016 Income Limits Summary for Ward County

## 5.3 Population and Affordable Housing Demand in Minot

### 5.3.1 Population Growth in Minot and the Minot Region

The City of Minot's population growth and changing population characteristics reflect a more urban community that serves a multi-county and bi-national trade region. Based on a recent study by North Dakota State University, Minot's population is expected to increase by 22.1 percent from 2014 to 2029 and the Region II, which includes Ward County and six others, is projected to realize a 21.7 percent population growth during the same period.

In addition to the population forecasts developed by NDSU, other forecasts at the federal, state, and regional level have been prepared to aid in predicting the need for housing and services in the oil and gas producing counties in the northwest region. In addition, the North Dakota Census Office's "Population Projections of the State, Regions, and Counties 2016" and data from the U.S. Census Bureau estimate different growth rates for Minot and the region. The consultant team analyzed these forecasts and reviewed data from Woods and Poole, Inc., a private data analytics firm, to select the forecasts for the Minot region and the City of Minot that best reflect the growth rate analyzed in research and petroleum industry studies in North Dakota, including a comprehensive long-term study of petroleum industry workforce and employment conducted by NDSU.<sup>46</sup>

A significant omission from previous forecasts, however, are the state's non-resident workers. A non-resident worker is defined under North Dakota income tax law as "an individual who either is domiciled in North Dakota or is not domiciled in North Dakota but maintains a permanent place of abode in North Dakota and spends more than 210 days of a tax years in North Dakota."<sup>47</sup> This significant shortcoming in other population forecasts was acknowledged by NDSU in their study. If the population forecasts are to be used for future planning in the northwest region of the state where many employees in the petroleum industry live in the state while they work but are permanent residents elsewhere, capturing the non-resident worker population is crucial to developing an accurate estimate of affordable housing demand. These non-resident workers in Minot require housing and services, they use the city's infrastructure and transportation network, and often enjoy recreational and cultural amenities in the City as well.

To provide population projections that incorporate housing demand for these non-resident workers, this study estimated the economic impacts of the petroleum industry in Minot and in Region II from 2015 through 2024. This analysis was conducted to assess the petroleum industry's potential impact on Minot's future population and thus on the city's future demand for affordable housing. The details of this analysis are included in Section 5 of this report and the detailed IMPLAN Model Analysis data can be found in **Appendix A**.

**Table 5.4** shows the population growth forecasts for the Minot Region (Region II) and the City of Minot including non-resident workforce population projections. The average annual growth rate (AAGR) is shown from 2015 to 2019 and from 2015 to 2024.

<sup>46</sup> Assessment of Oil and Gas Industry Workforce, North Dakota State University, Agribusiness and Applied Economics, May 2016.

<sup>47</sup> North Dakota Office of the State Tax Commissioner, FAQ's

**Table 5.4: Population Forecasts for the Minot Region and the City of Minot**

with Non-Resident Petroleum Industry Workers and Associated Multiplier Jobs Included, 2015-2024

	2015	2016	2017	2018	2019	2024	AAGR 2015- 2019	AAGR 2015- 2024
<b>MINOT REGION</b>								
Non-Resident Workers Excluded	103,380	105,775	108,225	110,731	113,296	118,606	2.3%	1.5%
Non-Resident Workers Included	110,739	113,789	117,290	121,373	125,647	135,292	3.2%	2.3%
Population Difference	7,359	8,014	9,065	10,642	12,351	16,686	13.8%	9.5%
<b>CITY OF MINOT</b>								
Non-Resident Workers Excluded	49,080	50,186	51,316	52,472	53,654	56,306	2.3%	1.5%
Non-Resident Workers Included	51,934	53,295	54,832	56,600	58,444	62,778	3.0%	2.1%
Population Difference	2,854	3,109	3,516	4,128	4,790	6,472	13.8%	9.5%

Base Population projections.

Data Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University; and CDM Smith.

## 5.4 Affordable Housing Demand in Minot

Based on this analysis, Minot's population is estimated to increase to 62,778 by 2024, a 21 percent increase in population from 2015. Based on these population projections, which include non-resident workers, an analysis was conducted to estimate new households and households that will be cost burdened for housing from 2015 to 2024. The analysis used as a baseline the 2011 – 2015 *Selected Housing Characteristics* from the American Community Survey data.<sup>48</sup> The housing characteristics utilized in this analysis include:

- housing tenure,
- total housing units,
- average household size,
- gross housing cost, and
- housing occupancy.

The ACS data reports 171 more housing units than the totals reflected in the Minot Assessors database, to maintain consistency, the ACS total unit count was used as the 2015 baseline for this analysis.

The 2012 Minot Affordable Housing Supply and Demand study was developed using HUD income limit data based on household incomes in Ward County. In 2011 the median household income in Minot was \$46,687.<sup>49</sup> Since HUD no longer produces household income data at the county level, the FY 2016 income limit data was generated based on family income and the 2016 median family income in Ward County is \$73,200. The HUD income limits are further refined based on the number of persons in a family as follows:

<sup>48</sup> U.S. Census Bureau, American Community Survey data, an ongoing survey research program utilized by the federal government to allocate funding for numerous federal programs. 2015 data is the most current information available.

<sup>49</sup> U.S. Census American Community Survey data 2011

- extremely low income (30% area median income or AMI),
- very low income (50% AMI), and
- low income (80% AMI).

The difference between the household median income and the family median income makes it difficult to make a direct comparison between the 2012 HUD data and the 2016 HUD income limits. By using the population projections that include non-resident workers, analyzing the total projected population, and converting that population to households based on Ward County data from the 2015 American Community Survey data sets, the consulting team developed owner and renter household data and utilized rental and homeownership costs data to determine the cost burdened households in Minot.

In 2024, Minot's population is projected to reach 62,778 an increase of 10,844 people. Using the 5-year average (2011 – 2015) to determine the average household size for home owners and for renters, there will be 25,294 households in Minot by 2024. In 2015, there were 21,755 total housing units in Minot. Additional households residing in Minot by 2024 will require the development of additional housing units.<sup>50</sup> Of the 25,294 households in Minot in 2024, 14,376 will reside in single family housing and 10,918 will reside in rental housing. As of 2016, there were 13,019 single family homes and 7,375 multifamily homes in Minot.<sup>51</sup> Based on Minot's the current housing inventory, over the next 9 years the city will need an additional 1,357 single family homes and an additional 3,543 multi-family housing units.<sup>52</sup>

Given the increases in population and rental and homeowner household estimations, an average historical housing cost burden factor was used to estimate the number of households that would be cost burdened for housing over the next nine years. Cost burdened for housing in renter households is expected to be higher as it has historically been in Minot. The number of households cost burdened for housing for 2015, 2017, 2019 and 2024 are shown in **Table 5.5**.

*Table 5.5: Minot Households Cost Burdened for Housing<sup>53</sup>*

	2015	2017	2019	2024
Cost Burdened Homeowners	2,616	2,762	2,944	3,163
Cost Burdened Renters	3,613	3,814	4,066	4,367
Total Cost Burdened Households	6,229	6,576	7,010	7,530

In the 2012 Minot Affordable Housing Supply and Demand Study, 28 percent of all households were cost burdened for housing. The 2024 data indicates that, without intervention, 30 percent of all households in Minot will be cost burdened for housing. Reflecting lower oil prices and fewer jobs, since 2011 as the availability of housing increased and rents declined, one would expect the cost

<sup>50</sup> The Minot Assessors data reports 21,584 units including single family, multifamily and mobile homes a slight variance of 0.0079 likely due to timing of the data collection by ACS.

<sup>51</sup> Minot Assessor database, 2016

<sup>52</sup> U.S. Census American Community Survey data, North Dakota State University 2016 North Dakota Statewide Housing Needs Assessment Component 1 – Population & Housing Forecast, and CDM Smith

<sup>53</sup> CDM Smith analysis, U.S. Census American Community Survey data, NDSU 2016 Population and Housing Forecast, State of North Dakota Census Office.



burden for housing to decrease. There are several factors that continue to drive the demand for affordable housing in Minot including:

- population growth that is expected to continue for the next nine years and beyond;
- a slower rate of income growth in non-oil sectors, a nationwide trend also evident in Minot;
- increases in housing costs for newer units reflecting higher-end finishes and more amenities; and
- the loss of some of the city's most affordable housing due to the 2011 flood.

Based on research conducted after the flood, there were 837 fewer affordable homes in Minot in 2012 than there were in 2010.

The boom-and-bust cycles of the oil industry may continue to have dramatic impacts on housing demand in Minot for the foreseeable future. The economic effects and cost impacts of these cycles is impossible to predict, even in those areas that have access to long-term data for oil related economic impacts and housing costs. In order to moderate the severe effects of these cycles on the community's housing, including both market rate housing and affordable housing, it may be advisable to consider monitoring various economic and construction metrics and evaluating changes to the permitting process to help minimize the potential for over-building during the boom cycles. Additional recommendations regarding metrics are included in later sections of this report.

## 5.5 Housing Demand for Minot's Unique Populations

### 5.5.1 Housing for Minot Air Force Base

As the region's largest employer with 6,487 military and civilian personnel, the Minot Air Force Base generates over \$577.8 million in annual economic impacts, one of the largest economic drivers in the entire state. Over 47 percent of active duty military and their dependents (2,794 families) and 100 percent of the 1,017 civilian employees live off base, primarily in Minot and Ward County.<sup>54</sup> Active duty military personnel receive a housing allowance; however, many advise the MAFB housing office they are priced out of the homeownership market in Minot. A recent study conducted by NDSU found many individuals who had worked in the Minot region were not likely to move to or remain in North Dakota because of the high cost of housing and the "fear that home values would someday fall below current prices" resulting in owners being "upside down" on their mortgage.<sup>55</sup>

The Air Force conducts Housing Requirements and Market Analysis (HRMA) studies for each base that evaluate available on-base and off-base housing and determines how much adjacent off-base housing is needed for the military community. To provide housing information to military personnel and data that is needed for the Military Basic Allowance for Housing, as well as other U.S. Air Force research, the MAFB Housing Office maintains an ongoing analysis of housing data in the region. The Air Force has established a minimum housing standard for off-base military housing which excludes

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<sup>54</sup> Economic Impact Analysis Minot Air Force Base, December 2014, prepared by Budget Office 5<sup>th</sup> Bomb Wing Comptroller

<sup>55</sup> NDSU Agribusiness and Applied Economic, "Assessment of the Oil and Gas Industry Workforce," May 2016

mobile homes and some older properties that have not been well maintained. According to Tim Knickerbocker, Chief of Housing for the Minot Air Force Base, 140 on-base housing units were demolished in 2016 and, at this time, there are no plans to demolish any additional on-base housing units.

In 2015 affordable housing for civilian personnel working at the base was an issue. As a result, a number of civilian positions critical to the base mission were vacant, , and the challenge of recruiting qualified civilians to fill these positions was a concern.<sup>56</sup> As off-base rents moderated in late 2015 and 2016, finding more affordable housing is not as challenging for civilian personnel. Currently, affordable housing does not appear to be a substantial issue for MAFB, however when oil prices increase, affordable housing will again become an issue for civilian personnel important to base operations.

### 5.5.2 Housing for Minot State University

The 2011 flood displaced 567 MSU students. After the flood enrollment declined 7.3 percent, primarily due to the loss of affordable housing near campus.<sup>57</sup> The MSU Foundation developed two student housing projects that provided new campus housing complexes adjacent to campus. An additional public-private housing complex was developed on Broadway across from the campus. Fall enrollment in 2016 increased by 2 percent, the first increase in enrollment in 6 years and the largest enrollment since 2013. MSU administrators no longer see housing affordability as an obstacle to the university's enrollment, but remain concerned about accessible and affordable housing for students given the affects the flood and oil boom had for the past five years. When oil prices increase affordable student housing will likely once again become an issue.

### 5.5.3 Affordable Housing for Minot's Vulnerable Population

Vulnerable people in Minot tend to experience significant challenges from the lack of safe, affordable housing. This section identifies vulnerable populations living in Minot and their associated housing needs. HUD's definition of vulnerable populations includes a wide range of people: seniors, veterans, people with special needs, low income and very low income citizens. Vulnerable populations within the City of Minot were identified using U.S. Census Bureau, 2010 – 2014 American Community Survey (ACS) 5-Year Estimates. The data was collected at the smallest geographic level available. For the seniors, veterans, low income and very low income this was the block group level. Data for special needs citizens is available at the census tract level.

### 5.5.4 Minot's Senior Population

A person 65 years old or older is considered a senior. Of the 51,009 people living in the city, approximately 12 percent (or 6,232 persons) are age 65 and older. This is slightly less than the national rate of approximately 14 percent. However, Minot and the U.S. have about the same percentage (2 percent) of persons 85 years old and older indicating that Minot has a slightly older senior population than the U.S.

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<sup>56</sup> Renetta Pearson, MAFB POC assigned to assist the City of Minot with NDRC Phase 2 MAFB data

<sup>57</sup> Economic Impact of the North Dakota University System in 2013, NDSU Applied Economics

The North Dakota Department of Commerce Census Bureau recently completed a study that found that people over the age of 60 were leaving the northwest North Dakota region in record numbers. Per the Census Bureau, the 2014 population of those over the age of 65 was expected to increase by over 750 people in Minot. Instead, that population group had 60 fewer residents than in 2010. Other towns in the northwest region experienced similar demographic changes. According to newspaper interviews, a number of these seniors left the northwest North Dakota region due to the cost of housing, the lack of more affordable quality housing options, and the changes in communities they called home for years as a result of the oil boom. At the same time, other cities in North Dakota (primarily Bismarck, Grand Forks, and Fargo) realized an increase in population for this age group. From 2012 to 2013 the senior population in Grand Forks County increased by 3.7 percent.

A slower rate of senior population growth may have an impact on health care and senior services in Minot. By 2029 over 8,000 seniors are projected to be living in Minot, an increase of 35 percent,<sup>58</sup> which is slower than the statewide average of 52.4 percent. The 2014 median income of Minot residents over the age of 65 was \$36,046, leaving many Minot seniors cost burdened for housing.

### 5.5.5 Minot Veterans and Disabled Population

In Minot, approximately 12 percent of the civilian population 18 years or older are veterans, compared with the national average of 9 percent. Over 4,699 veterans live in the city of Minot. Many are retired military and civilian personnel from the base who have chosen to remain in the area. Because of the MAFB and the number of retired military in the region, there are a number of veterans' services available. However, recent research indicates an increase in homeless veterans and demands on these services.

In Minot 7.8 percent of the population under the age of 65 is disabled compared to the North Dakota statewide average of 6 percent. There are several group homes and supportive living arrangements for the disabled in the City and the Minot Housing Authority is actively engaged in helping disabled persons find quality housing options.

HUD defines low income as families with incomes below 80 percent of the area median income (AMI) and very low income as 50 percent of the AMI. Using the data from the U.S. Census Bureau ACS that estimates the number of households in income bands, the number of low income and very low income households in Minot was determined. The graphic in Section 3 shows the income bands and the number of the households in each. Low and moderate income populations are geographically located throughout the city, however high concentrations (block groups with percentages higher than the city average) of vulnerable populations are in the northwest and southeast areas of Minot.

Affordable, accessible, well-located housing is vital to vulnerable populations. As discussed in Section 3, there are 651 units of long-term affordable housing currently available in Minot and the vacancy rate for these apartments is **3.2 percent**.<sup>59</sup> In addition, there are affordable rents within Minot in unsubsidized, privately owned housing. The availability of affordable rents in these units depends on

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<sup>58</sup> U.S. Census, American Community Survey Population Dataset

<sup>59</sup> Vacancy data from Minot Housing Authority, Beyond Shelter, and LIHTC units, 2016

the region's housing market, the local economy, as well as other factors. As these conditions change property owners will make decisions about the rents they charge tenants. However, just because a house is affordable does not make it accessible or well-located to meet the needs of vulnerable populations.

Many of the vulnerable people identified above have special accessibility needs to ensure their homes are accessible to them, such as no-step entry, single-floor living, ramps or elevators, extra-wide doorways and halls, accessible electrical controls and switches, lever-style door and faucet handles, and zero entry showers. Older homes can be some of the most affordable, yet these types of accessibility features are often not available. Newer homes or multi-family units and publicly subsidized units are more likely to have the required accessibility features.<sup>60</sup>

Proximity of housing to stores, services, and transportation enables seniors to remain active and productive members of their communities, meet their own basic needs, and maintain social connections. For those with chronic conditions and disabilities, the availability of housing with supports and services determines the quality and cost of long-term care.<sup>61</sup>

## 5.6 Evaluating Housing Demand

As discussed previously the demand for affordable housing is primarily determined by population and job growth, but the need for affordability is driven by availability of local jobs and wages. Many jobs available in Minot are concentrated in the trade and services sector which includes retail and wholesale trade, transportation and warehousing, accommodations and food services, and health care and social assistance. These service businesses are essential to Minot's economy and there are positions within these sectors that provide wages at or above the area's median income. However, the annual income for many of these employees is below the median income, making long-term affordable housing crucial to the city's economic resilience.

Based on the most recent rent study conducted by the Minot Air Force Base, the current average apartment rents in Minot are shown in **Table 5.6**.<sup>62</sup>

*Table 5.6: Current Average Apartment Rents*

Number of Bedrooms	Average Rent
1	\$675
2	\$800
3	\$1034

There are 4,859 families in Minot earning \$24,301 to \$36,750 which is 30 percent to 50 percent of the area median income. These families cannot afford the current average rent of \$1,034 for a 3-bedroom apartment. Many of these families live in poorer quality aging housing stock and/or may live with other family members or friends, and often work two or more jobs to afford decent housing for their

<sup>60</sup> Housing America's Older Adults, Meeting the Needs of an Aging Population, Joint Center for Housing Studies of Harvard University.

<sup>61</sup> Housing America's Older Adults, Meeting the Needs of an Aging Population, Joint Center for Housing Studies of Harvard University.

<sup>62</sup> Information provided by Tim Knickerbocker, Chief of Housing, Minot Air Force Base, 4<sup>th</sup> Quarter 2016 data



families. As Minot's population continues to grow, the demand for more affordable housing will increase.

Over the past 30 years, the period of affordability has become an increasingly critical consideration in providing affordable housing. Market rate multi-family housing in Minot is more affordably priced now because of an over-supply of units and the decline in oil prices and related oil industry employment. When oil prices reach a level that makes it more profitable to drill again, jobs will increase and the demand for housing and housing costs will rise as well. Only housing with longer-term affordability provisions in place will provide a stable supply of affordable housing for low and moderate income residents in Minot. This supply is needed to ensure affordable housing is available for area residents including essential workers in key economic sectors outside the oil industry such as health care workers, teachers, emergency personnel, and employees in the trade and transportation industry who continue to contribute to Minot's economic resilience.



## Section 6: Housing Supply Analysis

*City of Minot, North Dakota*





## Section 6: HOUSING SUPPLY ANALYSIS

“This is my home.” For generations, having a place to call home has been an essential part of the American Dream. Whether it is a tiny house, a high-rise apartment, or a country cottage sitting in the middle of a 40-acre farm, research shows that people, and more specifically children, have more positive outcomes in life, education, employment, and, physical and mental health if they have decent, stable, and affordable housing.<sup>63</sup>

To understand the housing supply in Minot, it is important to consider the existing housing inventory, development trends, and unique conditions affecting the supply. This analysis quantifies the extent to which the extraordinary volatility in Minot’s housing market, particularly in the past six years, has impacted the city’s supply of affordable housing. More precisely it reflects the supply of long-term affordable housing essential to a more resilient future for Minot. The simple answer is: affordable housing supply has certainly been affected. The specifics of that impact follow.



According to the Minot Assessor and Ward County records, by the end of the third quarter of 2016 there were 22,229 housing units in the city.<sup>64</sup> The current housing inventory includes **13,019 single family units; 7,375 multifamily apartments; and 1, 835 manufactured homes**. There were 3,234 new multifamily units constructed from 2010 to 2016, an increase of 77 percent. During that same period, an additional 1,305 single family homes were constructed (an 11 percent increase) and 617 additional manufactured homes were in the community (an increase of 34 percent).<sup>65</sup> To put this residential construction activity in perspective, from 1980 to 2007 there were 3,268 multifamily units constructed in Minot compared to 3,234 units constructed from 2010 to 2016.

When construction was completed and the unit passed a final inspection, these new housing units received a certificate of occupancy from the city. However, in June the consultant team noticed several multifamily developments still under construction or projects where it appeared construction had stopped prior to completion. To better assess how many multifamily units might be “in the

<sup>63</sup> “How Housing Matters to Families and Communities” an ongoing study by the MacArthur Foundation

<sup>64</sup> Minot Assess data includes single family units and multifamily units, the number of mobile homes was provided by Ward County Government.

<sup>65</sup> This represents total unit counts in 2010 and in 2016



construction pipeline,” the consultant team correlated building permits secured from 2011 to 2015 with certificates of occupancy to determine how many multifamily units were currently under construction. Based on that analysis, 184 additional multifamily units were determined to still be in the construction pipeline. To confirm these units should be included in the inventory pipeline, the consultant team made “windshield inspections” at five of these complexes and observed ongoing construction. Based on the assessor’s data and the pipeline inventory, the total number of multifamily units will increase to 7,559, subject to construction completion and final inspection of those 184 units.

An adequate supply of quality housing is essential to a resilient and prosperous city. However, supply alone is not sufficient to meet the housing needs of some households. There are many employees in Minot who provide essential services to residents and businesses in the community that do not earn an income allowing them to purchase or rent housing affordable to them. Some of these families pay in excess of 50 percent of their monthly income for housing, making it difficult to afford other essentials such as adequate food, transportation to jobs, or medicines. Certified nurse assistants (CNAs) who care for aging parents in assisted living facilities make an average of \$11.56 per hour, or approximately \$24,045 annually. Building and grounds maintenance personnel earn an average of \$13.02 per hour, or \$27,082 annually. Entry level emergency services personnel such as fire fighters, EMTs, and police officers earn \$44,688 annually in the North Central ND region.<sup>66</sup> It is difficult to imagine how any city can function without the people who perform these jobs, and many similar ones, every day.

In 2010 the average sales price for single family homes sold through the Multiple Listing Service was \$172,880. By 2016 the average sales price had risen to \$237,874.<sup>67</sup> According to housing valuation data from the Minot Assessor, housing values in Minot have increased steadily since 2010. **Table 6.1** shows the 2010 and 2016 single family housing supply based on valuation, broken down by number of units and the percentage of total units for each value band.

*Table 6.1: Single Family Housing Supply, 2010 to 2016*

Assess Values For Single Family Housing	2010		2016		Percent Change 2010 To 2016
	Number of Units	Percent of total units	Number of Units	Percent of total units	
< \$50,000	659	5.6%	145	1.1%	-78%
\$50,001 - \$100,000	2,609	22%	708	5.4%	-73%
\$100,001 - \$150,000	4,099	35%	2,718	21%	-66%
\$150,001 - \$200,000	2,348	20%	3,687	28%	57%
\$200,001 - \$300,000	1,658	14%	4,199	33%	153%
\$300,001 - \$400,000	260	2.2%	1170	9%	350%
>\$400,001	79	.67%	379	2.9%	375%
Total Units	11,712		13,006		

<sup>66</sup> Job Service North Dakota, North Central Region, Data analysis 2016

<sup>67</sup> Minot MLS Sales Data 2008 - 2016



In 2016 the residential units valued below \$50,000 include 62 single family homes, 70 condominiums, and 8 townhomes. There are currently 57 homes classified by the city as “blighted” on the city’s blighted property list, 7 of which will be acquired as part of the flood control project. These units will not meet HUD’s Minimum Property Standards and are, therefore, not included in the single-family housing supply inventory.

Households with incomes below 80 percent of median income are defined by HUD as low income. Minot’s median household income in 2015 was \$60,721; 80 percent of that is \$48,576.<sup>68</sup> A family at the top end of the 80 percent median could afford to spend \$1,214 monthly on housing. Forty-two percent of households living in Minot have annual incomes defined by HUD as low and moderate income. In addition to establishing income limits for affordable housing, HUD also prepares “Fair Market Rents” (FMRs) for jurisdictions. These FMRs are used in the Housing Choice Program as well as other HUD housing projects. **Table 6.2** shows the current FMR by number of bedrooms, income required based on HUD’s guidance for affordability, and percentage of households in Minot who could not afford an apartment at the fair market rent.

*Table 6.2: Fair Market Rents for Minot*

Number of Bedrooms	Fair Market Rent	Annual Income Required	Monthly Income Required	Percent of Households Who Cannot Afford FMR Rents
1	\$876	\$35,040	\$2,920	30%
2	\$1,173	\$46,920	\$3,910	39%
3	\$1,697	\$67,880	\$5,657	50%
4	\$1,999	\$79,960	\$6,663	61%

Today there are **3,282 fewer affordable single family homes** in Minot than there were in 2010.<sup>69</sup> It is increasingly important to provide sufficient housing that is affordable to people at all income levels to meet full economic development potential. Although Minot has benefitted from the growth of higher wage jobs in the oil and gas sector, those jobs tend to be cyclical and productivity advances from new technologies are likely to produce fewer of these jobs in the future. Workers in lower-wage jobs across key industrial clusters are the backbone of Minot’s economy as they support many functions and provide essential goods and services to residents, visitors, and businesses. Without an adequate supply of housing that is affordable to these employees, it will be difficult to attract and retain the kind of work force Minot needs to sustain and grow a dynamic and prosperous economy.

Forty percent of Minot’s population lives in rental housing. Based on population projections developed for this study, including non-resident workers, Minot’s 2015 population was 51,934. Approximately 11,900 households lived in owner-occupied housing while 9,032 households live in rental housing.<sup>70</sup> Of those households living in rental housing; **3,613 households spent over 30 percent of their monthly income for housing** and are, therefore, considered housing cost burdened. **By 2024, there will be 10,918 renter households in Minot and 4,367 of those households will be**

<sup>68</sup> American Community Survey, Household Income data 2015, U.S. Census Bureau

<sup>69</sup> Based on the valuation of single family housing units valued from \$50,000 - \$150,000 in 2010, compared to 2016, Minot Assessor Residential database.

<sup>70</sup> Sections 3 and 4, Minot Housing Supply and Demand Analysis 2016

**housing cost burdened.** Today, 40 percent of households with incomes below 80 percent of the median income are housing cost burdened and by 2024 there will be an additional 754 households. All of these households would benefit from access to long-term affordable housing.

### HOUSEHOLD INCOME NEEDED TO RENT



In the previous Affordable Housing Supply and Demand Analysis conducted in 2012, estimating the population was a challenge. Some people left the city after the flood due to increased housing costs and an inability to make necessary repairs. While the rest of the country suffered through a recession, new people came to Minot in search of oil jobs. Rents continued to increase through 2014. New residential developments were under construction, houses damaged by the flood were being renovated, and there were waiting lists for housing of all types. **Table 6.3** shows the cost of Available Rental Units in late 2012. There were 3,234 new multifamily apartments constructed from 2010 to 2016.

*Table 6.3: Cost of Available Rental Units in Minot, September and October, 2012*

Number of Bedrooms	Rent Range	Average Rent	Median Rent
1	\$500 - \$1,600	\$816.31	\$750
2	\$550 - \$3,950	\$1,312.88	\$1,150
3	\$875 - \$4,600	\$1,887.00	\$1,800
4	\$650 - \$4,000	\$2,238.91	\$2,195

Source: FEMA Housing Portal for Minot, 2012 and Minot Air Force Base Housing Database

While housing inventory has increased and rents have normalized, data from the American Community Survey and the North Dakota Statewide Housing and Population Study indicate a substantial percentage of Minot residents who live in multifamily units remain housing cost burdened. Market rate multifamily rents in Minot today are similar to those found in Bismarck, Fargo,

and Grant Forks. In Bismarck rents for 2-bedroom apartments range from \$590 to \$1100 per month with the average between \$750 and \$800 per month. Rents are slightly higher in Fargo where 2-bedroom apartment rents range from \$590 to \$1,280 with an average from \$800 to \$850. Rents for 3-bedroom apartments range from a low of \$710 to a high of \$1,750, with the highest rents found in Grand Forks.<sup>71</sup>

Based on the rental information gathered by the consultant team through the vacancy survey, calls to property managers, and information from the Minot Air Force Base, rents in Minot are more affordable now than they were in the previous four years. However, wage and income information, along with an analysis of employment concentrations and average wages in primary industry sectors in Minot, supports the housing cost burden data contained in the American Community Survey, Census data.

**Figure 6.1** and **Figure 6.2** show the location of new single family units and new multifamily units in Minot that were constructed from 2010 to 2016.



<sup>71</sup> Review of Zillow, Realtor.Com, and calls to local economic developers

Figure 6.1: New Single-Family Housing (2-10-2016)

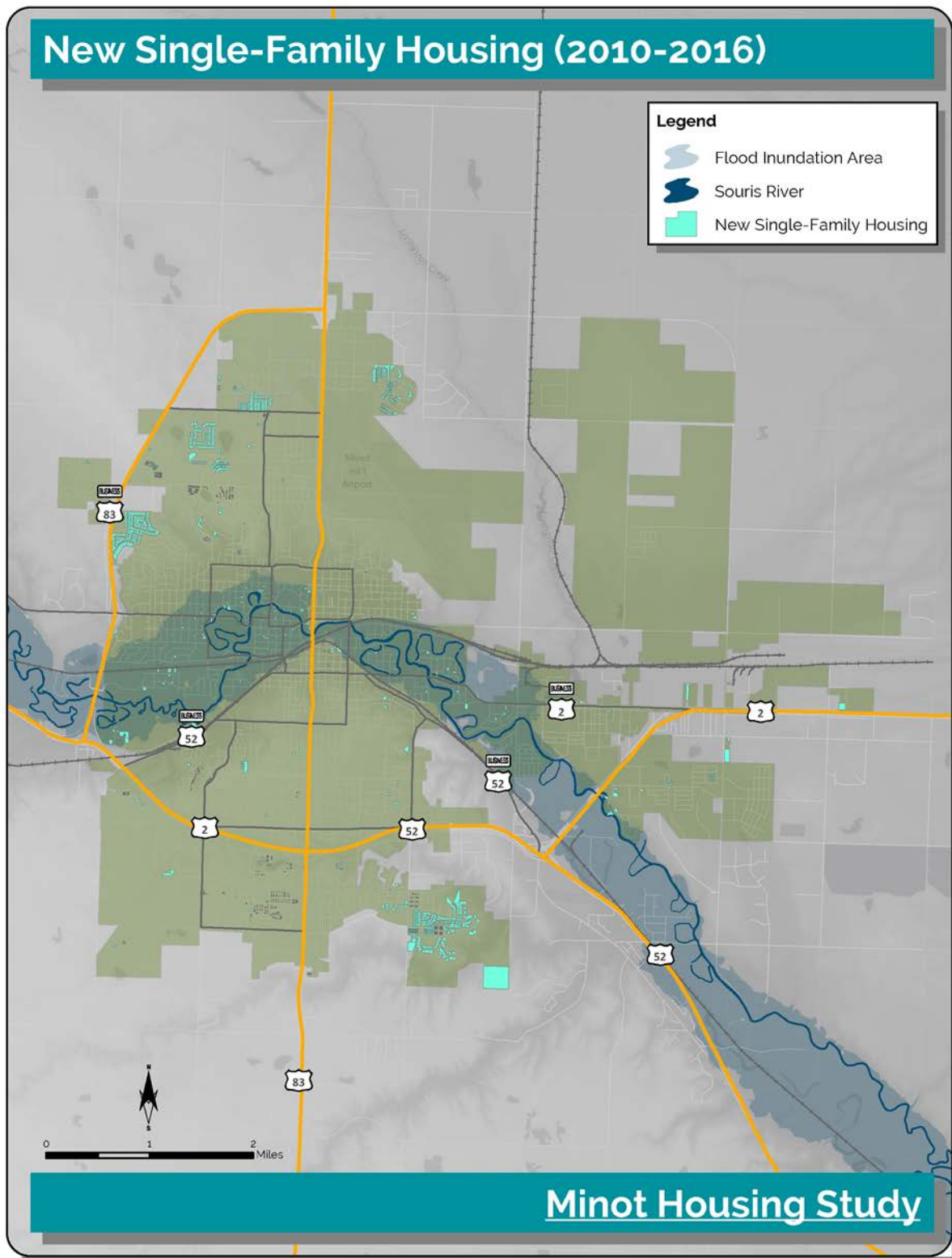
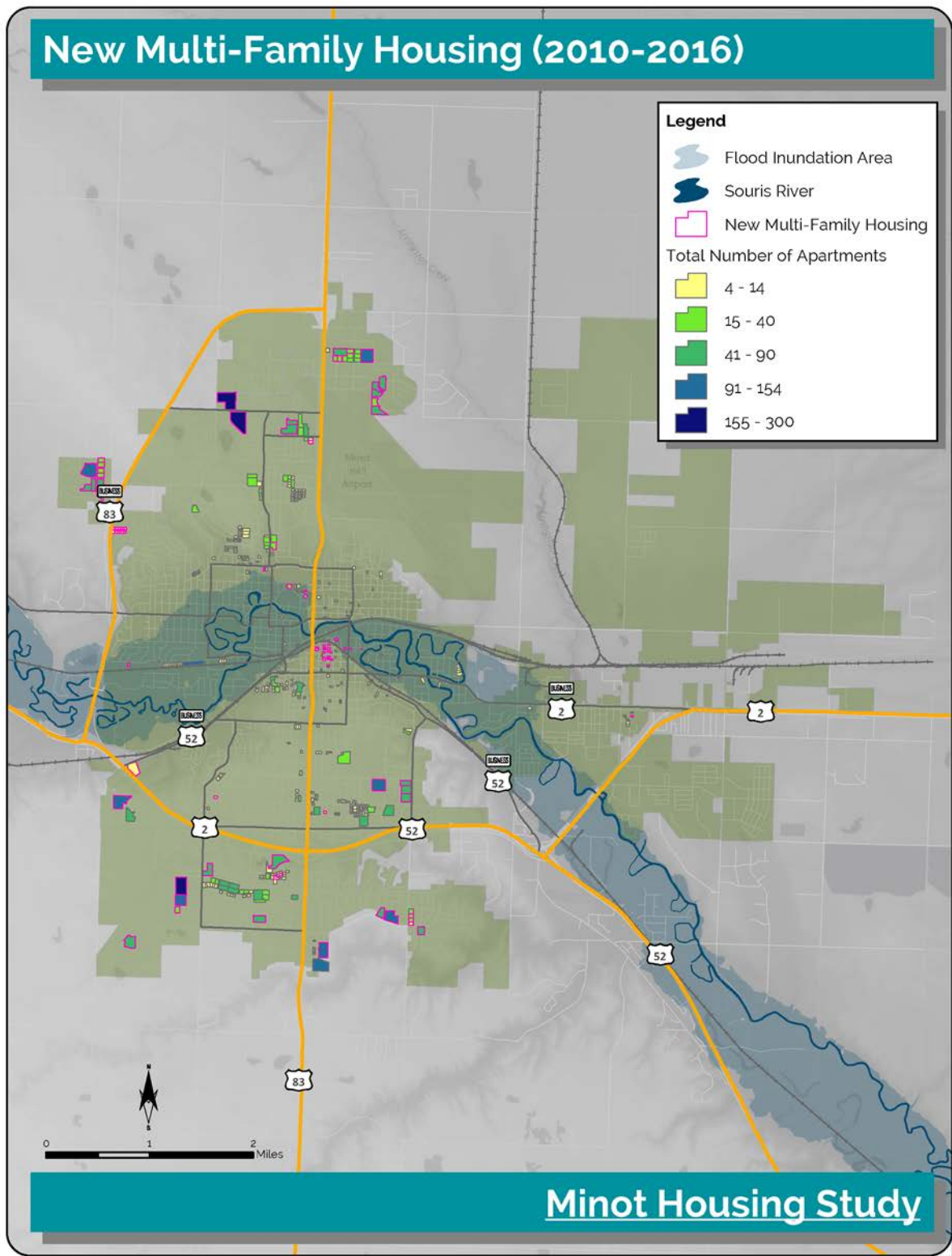




Figure 6.2: New Multi-Family Housing (2-10-2016)

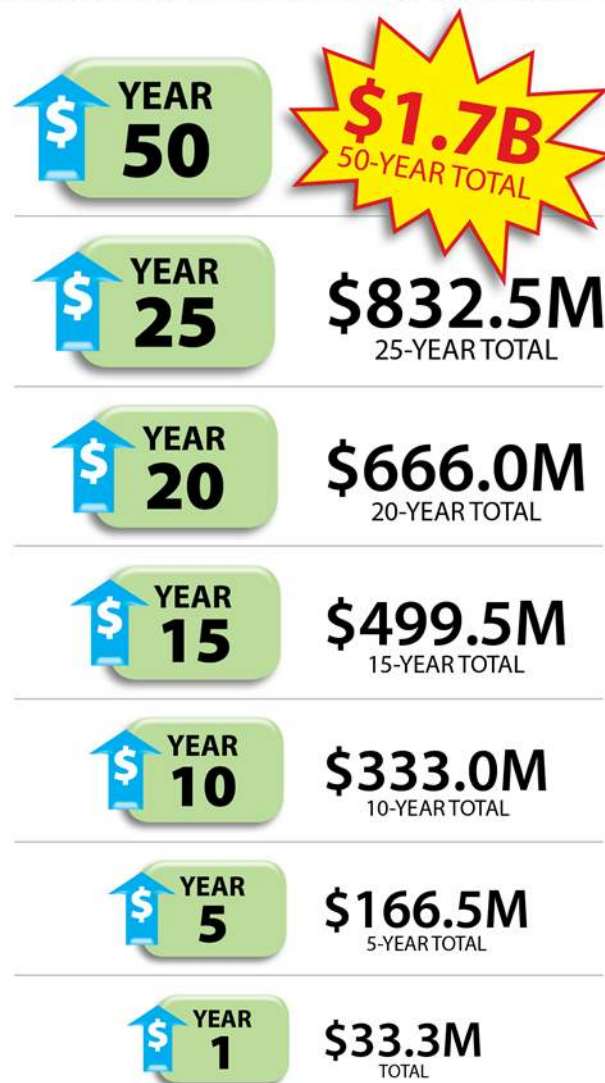


## 6.1 Unique Factors Affecting Housing Supply in Minot

### 6.1.1 The NDR Buy-out/Buy-In Program

A cornerstone of Minot's National Disaster Resilience project is the strategic **Buy-out/Buy-In** program that will move people out of harm's way in the event of a future flood as well as create affordable housing that enables low and moderate income (LMI) residents to afford to live in Minot. The footprint of the flood control project provided the initial framework for the buy-out program. The Souris River Decision Support Tool will give decision-makers a tool to provide a science-based risk analysis and process for prioritizing low-lying areas within the flood inundation area that could provide flood storage and reduce the cost of the flood protection system. An analysis of the Buy-Out program, using a HAZUS model for the Souris River and the 2011 flood, indicates a reduced 2011 flood loss of \$96.7 million had the proposed program been in place prior to the flood.

#### HOUSEHOLD INCOME RETAINED IN MINOT DUE TO BUY-IN PROGRAM



There are 576 parcels which are part of the buy-out program to be acquired for the flood protection project. Of the 300 residential parcels, 177 of have already been acquired by the City. Of the remaining 123 buy-out parcels, 109 are single family residences, 9 are multifamily properties containing a total of 61 apartment units, and 432 manufactured homes are located on the remaining 5 parcels. The 276 non-residential parcels include industrial and commercial uses, park district parcels, as well as some vacant parcels. **The residential buy-out parcels that have not yet been acquired will require the relocation of 602 households. The goal of the Buy-In program is to keep these residents in Minot.** (It should be noted that previously acquired residential parcels are no longer included in the Assessor's residential database.) NDR funds will be used to offer buy-outs for LMI households in the flood control project footprint. Additional funding required to complete the buy-out program will be provided by the State of North Dakota Water Commission.

The "Buy-In" program anchors the NDR Affordable, Resilient Neighborhoods project. After the flood, long-time residents and skilled workers left Minot, due in part to high housing costs. Many businesses in the city experienced serious consequences because of the lack of adequate affordable housing for hospital technicians, utility workers, emergency services personnel, and civilian personnel working at the Minot Air Force Base. The NDR Buy-In program provides \$34 million to leverage the renovation or construction of long-term affordable housing in Minot, enabling the community to be more resilient when future oil and gas cycles create volatility in the housing market. These additions will provide stable housing to residents that will remain affordable for 25 – 30 years.

Developing affordable, resilient housing allows households that move from the buy-out areas to remain in Minot. Based on the Benefit Cost Analysis prepared for the NDRC Phase II application, over a 10-year period the buy-in program will retain \$333 million in direct and indirect income in the city. Over the 50-year anticipated benefit period, the buy-in program will retain \$1.7 billion in income within Minot.

### 6.1.2 HUD's "One-for One" Replacement Requirement

It is HUD's policy to minimize residential displacement for homes and neighborhoods assisted through HUD programs. Minot has received a case-by-case basis waiver that exempts some houses damaged by the flood from the "one-for-one" requirements.

Section 104(d) of the Housing and Community Development Act of 1974 establishes requirements "governing conversion, demolition, and one-for-one-replacement of lower-income housing under the CDBG program." National Disaster Resilience (NDR) funds will be used to acquire and demolish structures within the flood control project in Minot and may be used to acquire parcels in areas designated for future flood mitigation. Residential units within the buy-out area that are acquired using NDR funds and do not fall under the existing waiver must be evaluated by a qualified appraiser to determine the current rent for the unit, this includes both single family homes as well as multifamily units. If there are units that will be acquired and demolished that would rent at or below the current Fair Market Rent (FMR), the city must ensure there are new affordable units available. The new units should have a similar number of bedrooms and the minimum affordability period is ten years, however HUD prefers a longer affordability period of 25 – 30 years.

Additional analysis is being conducted on residential properties in the buy-out area to assess how many of these units might be subject to the “one-for-one” replacement requirement. As this analysis is completed the impact of this HUD requirement on the affordable housing supply and demand should be factored into this analysis.

### 6.1.3 Minot Air Force Base On-Base Housing

The Air Force requires the preparation of a Housing Requirements and Market Analysis (HRMA) study to determine the number of homes needed on the base. This study evaluated available housing in off-base areas and determined the need for adjacent on-base housing required to provide necessary housing for military personnel. In 2016, 140 homes were demolished and, at this time, no additional demolition of on-base housing is planned for 2017. The reduction in on-base housing assumes availability of off-base housing that meets the housing standards established by the Air Force.

## 6.2 Why Affordable Housing Matters to Minot’s Future

Why should people who do not directly face a housing affordability issue be concerned about the availability of decent affordable housing in their community? Because, like it or not, it affects Minot’s economy, business, community quality and can affect the value of real estate assets and investments. As the economy continues to grow, population will increase and multifamily occupancy rates will increase. A vibrant and diverse economy is the best strategy to achieve a stable and prosperous real estate market in both the residential and commercial sectors. The availability of the National Disaster Resilience funds gives Minot an opportunity to expand the supply of quality housing that is affordable long-term that will stabilize the employment base for some business sectors with lower wages.



# Section 7: Future Housing Supply and Demand and Affordable Housing Market Gaps in Minot

*City of Minot, North Dakota*





## Section 7: FUTURE HOUSING AFFORDABILITY AND NEEDS IN MINOT

According to a recent study from Harvard University's Joint Center for Housing Studies, in the U.S. almost one in four households currently living in rental housing is spending more than 30 percent of their monthly income for that housing.<sup>72</sup> Limited availability of affordable housing options is becoming a critical problem in many cities around the country and the problem has significant consequences. Without stable, long-term affordable housing options, cost-burdened renters and homeowners must make choices about basic needs that often have health and employment consequences. As mentioned in previous sections, the economy requires a broad set of people and skills to function. Some occupations vital to the community have lower wages which, in turn, means lower incomes for those who perform them.

Because affordable housing matters, the City of Minot has supported the development of additional affordable housing that will remain affordable for the long-term. The city has become an increasingly desirable place to live. Even with the decline in oil jobs, people are continuing to move to Minot, some are returning, and young families with roots in the area are coming home. Projections show that the city's population will continue to increase in the future and by 2024 will reach nearly 63,000, of which 7,530 households will be housing cost burdened.

### 7.1 Current Supply of Long-Term Affordable Housing in Minot

Using the most current household income data for Minot, there are 7,951 households with incomes defined as low income based on HUD's income limits (below 80 percent of the median household income).<sup>73</sup> Sixteen percent of the households in Minot make less than \$25,000 per year and are considered extremely low income.

Minot's affordable rental housing inventory includes: Low Income Housing Tax Credit (LIHTC) developments, public housing owned by the Minot Housing Authority, single family units managed by the Minot Housing Authority, and rental units that receive assistance under the Housing Choice Voucher Program. Some of the rental units qualify as long-term affordable housing based upon the legally mandated affordability period. (See **Table 7.1.**)

The Minot Housing Authority receives an annual allocation of funds that must be used for rental assistance. These funds are administered through the Housing Choice Voucher Program. Eligible applicants must have an income below 50 percent of the area median income. Housing that is rented

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<sup>72</sup> *The State of the Nation's Housing 2016*, Joint Center for Housing Studies of Harvard University

<sup>73</sup> U.S. Census, 2015 5-year American Community Survey Household Income data

through this program must meet HUD's Minimum Property Standards. Participants pay rent based on 30 percent of their income and Housing Choice funds pay the difference between what the tenant can pay and the established rent on the unit (up to HUD's annual fair market rent for Ward County).

As housing costs in Minot have increased over the past six years, rental assistance payments for each unit have increased thereby reducing the number of households that can be assisted through this program. In 2008, the average per unit voucher assistance cost was \$298. Because HUD's FMR's are based on prior year data, the 2015 per unit voucher assistance cost was \$594.<sup>74</sup> While the Housing Choice Voucher Program is invaluable to low income households in Minot, the assistance only covers a 12-month period and the number of households that can be helped changes as housing costs increase.

One additional challenge regarding the Housing Choice Voucher Program exists. In order to move people out of harm's way, the City of Minot plans to use NDR funds to support a Buy-Out program to acquire properties within the flood control project. HUD regulations establish mandatory affordability periods under their "one-for-one replacement" requirement governing "conversion, demolition, and replacement of lower-income housing under the CDBG programs".<sup>75</sup> The complexities of this requirement must be analyzed on a case-by-case basis. Housing vouchers do not meet the mandatory affordability period and cannot be used to meet the affordable housing requirements.

*Table 7.1: Long-Term Affordable Rental Housing in Minot*

Complex	Total Units	Vacant Units	Notes
<b>LIHTC PROJECTS</b>			
Cooks Court	40	0	
Fieldcrest	42	4	
Oakwood Court	7	0	
Washington Complex	64	4	
Sunset Ridge I	35	30*	Construction recently completed, lease up just initiated
ArtSpace	34	2	
South Glen Village	48	0	
<b>MHA PUBLIC HOUSING</b>			
Milton Young Towers	219	9	
Henry Towers	83	6	MHA provides management services but does not own these units
<b>Housing Choice Vouchers</b>	449	0	MHA receives an annual allocation for HCV. The annual allocation is subject to budget and appropriation constraints. Vouchers cover a portion of the rent for a qualified tenant for a 12-month period
<b>AFFORDABLE UNITS</b>	1,021	25*	Does not include 30 units just completed in Sunset Ridge I

As discussed in previous sections of this study, housing affordability is based on household income and is considered affordable if housing costs do not exceed 30 percent of monthly gross income. In the past several years, as lending requirements for homeownership have become more restricted, many mortgage lenders require higher minimum down payments and higher credit scores. These requirements make it very difficult for many moderate and middle income households to afford to buy a home, and almost impossible for lower income households to do so. In the past, homebuyers

<sup>74</sup> Data from interview with Mark Austin, Occupancy Director, Minot Housing Authority

<sup>75</sup> Section 104(d) Relocation and One-for-One Replacement Requirements, Chapter 7, U.S. HUD

were often told they could afford a home that was 3:1 home value to household income. Today some lenders consider a more conservative affordability calculation of 2.5:1 home value to household income.

Based on 2016 housing valuation data from the Minot Assessor's Office, there are 3,282 fewer single family homes valued below \$150,000 in 2016 than there were in 2010.<sup>76</sup> In 2016, 708 single family homes were valued from \$50,000 - \$100,000 and 2,718 were valued from \$100,001 to \$150,000. Because Minot generally has a low incidence of sub-standard housing, this analysis assumes that these homes represent housing that could meet HUD's Minimum Property Standard requirements. Given that, there are 3,426 single family homes, or 26 percent of the housing inventory, valued below \$150,000 that could be affordable to low income households.<sup>77</sup>

**Table 7.2** was prepared to assess loan amounts and single family sales prices that would be affordable for households in various income ranges. This was based on the lowest down payment allowable under FHA programs for a 30-year fixed rate mortgage, a 3.867 percent mortgage interest rate,<sup>78</sup> \$300 monthly household debt, and does not include points, closing costs, debt allocation, or property taxes.

*Table 7.2: Housing Costs by Income Ranges 2016*

Gross Annual Household Income	Down Payment	Estimated Loan Amount	Affordable Home Sales Price
\$40,000	\$2,000	\$85,261	\$87,261
\$50,000	\$2,000	\$115,954	\$117,954
\$60,000	\$4,000	\$156,880	\$160,880
\$70,000	\$4,000	\$197,805	\$201,805
\$80,000	\$6,000	\$238,730	\$244,730
\$90,000	\$6,000	\$279,655	\$285,655
\$100,000	\$8,000	\$320,580	\$328,580

Source: Zillow Mortgage Calculator 2016

Based on data from the Minot Multiple Listing Service, as of November 1, 2016 there were 169 residential units listed for sale below \$200,000 (new construction single family, condo/townhomes, existing homes within and outside the flood inundation area).<sup>79</sup> In the first 9 months of 2016, 163 residential units less than \$200,000 were sold in Minot. For comparison, there were 445 residential units sold for less than \$200,000 in 2010.

In the first 9 months of 2014, 2015, and 2016 (January 1 – September 30) an average of 111 homes each year were sold for less than \$175,000. In 2010, 292 homes sold for less than \$175,000 during the first 9 months of the year. While it is not possible to estimate the number of single family homes that may be available for sale at a price affordable to low income families, it is reasonable to assume there are

<sup>76</sup> Single family homes valued below \$50,000 were excluded from this estimate as many of those units are likely not to be habitable or would require significant rehabilitation to be made habitable.

<sup>77</sup> There are households living in single family housing acquired when housing costs were more affordable. Unfortunately, documentation does not exist that allows for the correlation of current household income to original purchase price, so it is not possible to capture this information in the affordable housing inventory.

<sup>78</sup> Current national average mortgage interest rate for 30-year fixed mortgage.

<sup>79</sup> Minot Multiple Listing Service Market Statistics, 11/1/16



substantially fewer in 2016 than there were in 2010. For this analysis, it will be assumed that 100 single family homes below \$150,000 will be sold each year. (Assuming a home for sale below \$150,000 would be affordable to households with incomes below 80 percent of the median household income)

## 7.2 Affordable Housing Demand

Minot's population is projected to reach 55,000 in 2017. There will be 12,557 owner-occupied households and 9,532 renter households. Of those households, 6,576 will be housing cost burdened. As the city's population continues to grow, there will be a need for additional affordable housing as shown in **Table 7.3**.

*Table 7.3: Population Projections and Cost Burdened Households*

Year	Population			Cost Burdened Households		
	Projections	Owner-Occupied	Renter	Owner Occupied	Renter	Total
2015	51,934	31,160	20,774	2,616	3,613	6,229
2017	54,832	32,899	21,933	2,762	3,814	6,576
2019	58,444	35,066	23,378	2,922	4,065	7,010
2024	62,778	37,667	25,112	3,163	4,367	7,530

In 2016, there are 1,058 long-term affordable rental housing units in Minot and 3,613 cost burdened renter households, a GAP of 2,555 units. If additional long-term affordable rental housing is not developed, by 2024 that GAP increases to 3,309 units.

There are 3,426 single family homes valued below \$150,000. However, given historic MLS market data, fewer than 100 single family homes in that range may be for sale in any single year. By 2024, the population in Minot will reach almost 63,000 and require an additional 547 affordable single family homes for low and moderate income households that can purchase a home.

By reviewing the 2016 map of Assessed Valuation of Single Family Housing (see **Figure 3.6**) there are three areas of the city outside of the flood inundation area where the more affordable single family housing is located. These are:

- A. East of Broadway, north of the flood inundation area;
- B. East and west of Broadway south of downtown and north of Highway 2; and
- C. East of Broadway, south of Burdick Expressway, north and south of Highway 2.

## 7.3 Buy-Out/Buy-In Program

The NDR Buy-Out program will acquire an additional 109 single family residences, 9 multifamily properties with a total of 61 apartment units, and 5 parcels where there are 432 manufactured homes. This means, these 602 households will need to find suitable housing over the next four years. Some of these households have incomes well above the area median income allowing many housing options affordable to them. If we assume households currently living in manufactured homes plus 40

percent of the remaining households will need affordable housing, 500 households will need access to Buy-In housing options that are affordable long term.

Using funds from the NDR grant, Minot can facilitate the development of additional affordable long-term housing. One option being considered is the development of a resilient manufactured home subdivision with 250 lots manufactured homes could be located. Several companies now offer mortgages for manufactured homes and lots, enabling many families who never dreamed of becoming homeowners to do so.

## 7.4 Conclusions

The Minot Housing Supply and Demand Analysis provides an in-depth analysis of factors and conditions that continue to impact the supply and demand for affordable housing. The analysis identified significant changes in the housing market in Minot over the past six years. Many changes can be attributed to two factors: the 2011 flood; and the boom in the oil sector which began to escalate just prior to the flood, and continued for several years after. During that period, Minot was fortunate to miss the housing collapse of the recession, but changes in the housing market in the City were far more dramatic and occurred over a shorter period. This is evidenced by the rapid expansion of multifamily housing, the increase in housing values and corresponding sales prices, and the increasing need for affordable housing.

The housing market in Minot is extremely complex. Forty percent of renter households are cost-burdened, paying more than 30 percent of their income for housing. This number is the same in 2016 as it was in 2012. Those households with incomes below 50 percent of the median household income, or approximately \$30,367 annually, cannot afford the average rent on a two-bedroom apartment. Households with incomes below 30 percent of the median household income, or about \$18,216 annually, can only afford \$455 a month for housing. Many of these lower income households end up spending over 50 percent of their income for housing and routinely face the consequences of inadequate food, medicine, or savings to cover unexpected emergencies.

Over-building in market rate multifamily units, and the resulting vacancy rate, has created genuine concern on the part of property owners and managers. The rising price of oil creates concern about future housing costs and affordability. Is it possible to develop strategies that might convert some of the moderate market rate multifamily units to long-term affordable housing; and in doing so, help bring down the multifamily vacancy rate? In the future, can Minot develop metrics to effectively monitor over building in the housing market before it occurs in an effort to maintain realistic and reasonable residential property values in the city? Is it possible to develop practical housing development policies based on measurable metrics that would enable the City to better manage construction impacts of the boom-bust cycles generated by the oil industry; and in doing so, improve and stabilize the city's housing? Because of the NDR grant an important opportunity exists for Minot to address this issues. .

# Section 8: Recommendations for the Future: Achieving Resilient and Affordable Housing for Minot

*City of Minot, North Dakota*







## Section 8: RECOMMENDATIONS FOR THE FUTURE: ACHIEVING RESILIENT AND AFFORDABLE HOUSING FOR MINOT

A resilient Minot provides a range of housing options to meet the needs of the people who help to ensure the city remains an outstanding place to live and work, and can continue to support a diverse economy providing quality jobs. Affordable housing is an important issue for everyone in the community, not just for those who need it. Every day the people and businesses in Minot rely on employees that help to ensure important tasks gets done but do not earn a wage that enables them to afford many of the housing options available in the city. The contributions of these employees are crucial to business operations, health care services, public safety, and many other essential workforce tasks.

The recommendations contained in this report were developed to provide the city, community and business leaders, and other partners with specific resources and strategies that can be beneficial in the development, renovation, and preservation of affordable housing. The housing market and conditions in Minot have been “held captive” by the dramatic cycles fostered by the oil and gas industry for the past six years. Taking steps to reduce some of those impacts will help to moderate swings in real estate market values, overbuilding, and steep increases in rents that force some people to move away from Minot or fear investing in housing in the future.



The National Disaster Resilience grant provides an invaluable resource to help Minot to recover from the physical effects of the disaster and become a more resilient community in the future. Greater economic diversity can help to moderate the impacts of the “roller coaster” oil and gas sector and attract new industry sectors to the region like unmanned aerial vehicles (aka drone technology), advanced food science, and perhaps advanced risk reduction technologies tied to water management. Affordable housing will provide housing options for a workforce that existing companies depend on and the next generation of Minot businesses need to be competitive.



## 8.1 Recommendations and Strategic Actions for Affordable Housing

*“If you don’t know where you want to go, you are unlikely to get there”*

By 2024, there will be 7,530 households in Minot who will be housing cost burdened; 3,163 who live in owner-occupied housing and 4,367 who live in rental housing. The availability of affordable owner-occupied housing depends upon the inventory of affordable housing units and the turn-over within that existing inventory. In addition, affordable housing units may be developed within the marketplace that are affordable to households with incomes below 80 percent of median household income. The availability of affordable rental housing depends on the inventory of long-term affordable units, not just units that may be affordable only as long as the oil and gas industry is depressed. Today, Minot has 609 units of long-term affordable housing that will remain affordable for at least the next 20 years. Also, the Minot Housing Authority also has resources for approximately 449 Housing Choice Vouchers that provide rental assistance, for a 12-month period, to very low income households.

Given the population projections, workforce income data, and housing units needed to provide availability of long-term affordable multifamily and ownership housing and support the NDR Buy-Out/Buy-In program Minot, the study team recommends the following goals for affordable housing development in Minot.

### 8.1.1 Affordable Housing Development Goals

- A. **Develop 1,125 units of affordable rental housing over the next 10 years.** These units should have a minimum affordability period of 20 years and should be affordable to a range of low income families. Developing affordable housing is NOT an easy task and requires effective and creative use of all available affordable housing resources including Low Income Housing Tax Credits, future Community Development Block Grant funds, and other federal, state, local, and foundation resources. In North Dakota, it is very important to preserve the Housing Incentive Fund (HIF)

Development of an additional 1,125 long-term affordable rental housing units will not address the entire affordable housing need. In Minot, there are rental housing options that will be more affordable because of: the age of the housing units, owner/manager preference to reduce turn-over, previous housing subsidies provided that require shorter term affordability periods, the condition of the housing units, and related factors. However, with 1,734 units of long-term affordable housing in place, some of the cyclical impacts from the oil and gas sector can be better absorbed by low and very low income households.

Developing affordable multifamily housing is challenging however, and additional complexity must be considered in Minot. The higher market-rate multifamily housing vacancy rate creates additional political and market challenges. Thus, it is important to be sensitive to these vacancy rate issues and look for opportunities to expand the

availability of affordable housing that may also help moderate/reduce the market-rate multifamily vacancy rate. Additional recommendations to help with this issue are included in this section.

One final note, Minot is fortunate to have two experienced non-profit housing developers, Beyond Shelter and Essential Living, who are actively engaged in developing long-term affordable housing. Many communities with substantially larger populations are not as fortunate. Developing affordable housing at costs that are truly affordable requires the effective use of every available tool and resource, experienced and dedicated non-profit housing developers are a *Crown Jewel* in that effort.

- B. Develop a resilient, affordable manufactured home subdivision for 250 homes.** Within the Buy-Out program that is essential to the flood control project, there are approximately 432 units of manufactured housing within existing “mobile home parks.” Many of these homes provide very affordable housing for residents. According to the Minot Assessor, there are only 1,865 mobile home lots in the city and presently there are 1,835 mobile homes in Minot. With the very limited inventory of spaces available to locate mobile homes, the importance of the Buy-Out program, and HUD’s “one-for-one replacement” requirements; creating a manufactured home subdivision may be one of



the best Buy-In strategies for retaining and replacing this housing.

At the City’s request, the consultant team developed a basic concept layout for a manufactured home subdivision that included most of the resilient features identified during the public engagement process for the application. The team also produced a development cost estimate based on two development density scenarios.

The consultant team has also

prepared a development strategy, innovative design and procurement process, and timeline for this project that could be deployed if a decision is made to move this concept forward.

- C. Develop a program to support the purchase, development, renovation, or infill development** of an additional 150 units of affordable single family homes in resilient neighborhoods. The original Minot NDR application envisioned the development of new resilient neighborhoods and gap financing for 250 LMI homebuyers. The competitive NDR process required all applicants to include a strategy to “scale and re-scope” if full

funding was not available. While Minot's award of \$74.3 million is outstanding, it will not allow the City to do everything envisioned in the application.

To meet the needs of the Buy-Out/Buy-In program and facilitate more resilient neighborhoods, this recommendation follows the vision of the NDR application. The Affordable Housing Neighborhoods Site Study to help identify the best sites for resilient neighborhoods has been initiated. This analysis will identify locations within the city that could effectively support the development of new affordable homeownership properties. By carefully selecting quality locations with existing resilient amenities, additional resilient features could be incorporated. A gap funding program for homeownership would be further refined working with the Affordable Housing Advisory Committee, NDR Partners, MHA, the North Dakota Housing Finance Agency, and area realtor and contractors.

- D. **Develop a shelter facility to house homeless families in Minot.** The Vulnerable Populations Committee held 13 meetings during the NDR Phase II Application Process. Many issues affecting vulnerable people in Minot were discussed in these meetings. However, when the Committee was asked to identify and prioritize projects for the NDR application, the project they ranked number 1 was a homeless shelter for families. Minot now has a homeless shelter for women that allows girls and boys under the age of 11 and there is a Men's Winter Refuge which is opened in the evening during winter months.

Funds were included in the NDR grant to develop a shelter for families and provide additional facility space for services for the homeless. To quantify the shelter need research and interviews with service providers have been completed to determine, to the extent practical, the number of homeless families in Minot during a 12-month period. Additional research has been completed to assess operating and management requirements and project operating expenses, as well as evaluate funding sources for a shelter. Work on this project continues to progress with the goal of completing an appropriate facility by September 2019.

### 8.1.2 Affordable Housing Policy and Procedure Goals

- E. One of the most important strategies for ensuring an inventory of more affordable housing is through the **maintenance and preservation of the city's existing housing stock**, particularly the supply of older, functional houses. Often the first line of defense in this effort is the City's building and inspections department. These professionals know about construction standards and practices, the local ordinances and regulations, safety standards, and national, state and local requirements.

A program that routinely conducts field inspections of neighborhoods will identify potential problems before they become serious challenges. Review of existing ordinances and regulations is an important step in building an inspection program to promote housing property standards. If the City of Minot has not evaluated their regulations, ordinances, and practices for monitoring the condition of existing housing, this would be a high priority recommendation to securing and preserving the existing

housing stock, which will in turn help to maintain some of the more affordable existing housing in the city.

Having proper regulations and ordinances in place is only the first step in achieving this goal. Ensuring there are an adequate number of well-trained inspectors is necessary to implement an effective program. The International Conference of Building Officials is one of the largest professional organizations providing research, model ordinances, and training for housing and building inspections. They can provide guidance on training needs and staffing requirements for housing inspection programs and, once the City of Minot becomes a HUD Entitlement Jurisdiction for the Community Development Block Grant Program (CDBG) in the next few years, CDBG funds can be used to help support an inspection program

- F. **Increased residential densities and small lot development** enables single family homes to be built on smaller lots than typically allowed in single family zoning. Some communities are including the popular “tiny houses” in small lot districts as well as smaller homes with less than 1,000 – 1,500 square feet. The Minot Planning Department would need to evaluate the benefits of modification to the City’s existing zoning codes to determine if a small lot district could be beneficial and meet the city’s quality housing standards.

In some cases, smaller lot sizes can enable development on lots where only a portion of the lot is developable, and can also promote infill development in some areas. Often small lot ordinances allow for a level of flexibility regarding setbacks, floor-area coverage ratios rather than dwelling units per acre, and the size of the housing unit the lot will accommodate. When land costs are high or unique/fragmented lots exist, small lot ordinances can make development more affordable and can accommodate the location of tiny homes as well.

- G. **Further evaluation of the City’s Mobile Home District** would be beneficial to promote the development of more resilient and affordable manufactured home subdivisions. This process led by the Planning Department but should include professionals from the City’s engineering department, fire and police, and the parks authority. In some cases, the existing ordinance may not reflect the type of manufactured home development that is more desirable for today’s consumers. However, street widths, utilities, and some setback requirements may need to be reviewed to determine if it is possible to relax some requirements. The Planning Department may also want to consider encouraging developers of manufactured home subdivisions to develop design standards that address key design features, maintenance requirements, landscaping, and related issues for their development. Balanced design standards help promote quality designs without imposing restrictive and costly requirements and can help enhance community acceptance of this more affordable housing option.



- H. **Coordinating residential land use and transportation policies** helps low and moderate income households manage limited financial resources more effectively. Promoting housing close to transit and employment opportunities is important to achieving overall housing affordability. Few cities the size of Minot have a transit system, this is a significant community asset. Opportunities to coordinate residential development and densities with transit services create a significant benefit for low and moderate income families.

As land use and transportation plans are updated, developing a vision that encourages higher density housing development, mixed use developments, and transit accessibility would be valuable. The Minot Planning Department has expressed a desire to review these considerations further in order to strengthen policies and programs to promote access to transportation options linked to more affordable housing development. This study recommends further evaluation of these opportunities based on the Planning Departments review and assessment.

## 8.2 Who will Lead? Building Community Support for Resilient, Affordable Housing

The challenge of building affordable housing will not happen unless people understand “why” it is important and are willing to commit to help support affordable housing. Many communities have failed to respond to the housing needs of low and moderate income families because people opposed it without understanding who would live there, and why affordable housing to these neighbors was also important to them. As the price of oil begins to increase again, this issue becomes even more important for the community to address as housing costs will begin to rise if this sector starts to produce more oil from fracking in this region.

To facilitate the preservation and expansion of affordable housing in Minot, business leaders, private developers, and citizens must join public officials and work together proactively to build quality housing that is well managed. The leadership for this effort must be identified and agree to step up. Minot is in the unique position of having the financial resources to develop additional affordable housing through the NDR grant. Community support is essential: engage the media, social media, and define a clear and concise message. This is the chance to build a more resilient Minot.

# Appendix A: IMPLAN Model Analysis and Methodology

*City of Minot, North Dakota*





## Appendix A: IMPLAN MODEL ANALYSIS AND METHODOLOGY

### Study Approach

This section describes the economic modeling process, data requirements, model assumptions, and study multipliers used in this report to estimate the economic impacts of the petroleum industry in the Minot region.

### The Economic Modeling Process

All economic impacts for the petroleum industry in the Minot region were calculated using an input-output model. The input-output model considers economic impacts associated with oil and gas drilling, extraction, and production; infrastructure development; professional services; transportation; and wholesale trade and manufacturing. Impacts that are discussed include the following:

- **Direct Impacts** – Direct impacts include the employment, payroll, and spending of two broad categories of firms involved in the petroleum industry: direct oil and gas establishments and related oil and gas establishments. Direct establishments are involved in all activities tied directly to well-pad operations, including the drilling, extraction, and production of crude oil, natural gas, or natural gas liquids. Related establishments are involved in key support activities for well-pad development, operation, and maintenance including infrastructure development, professional services, transportation, and wholesale trade and manufacturing.<sup>80</sup>
- **Multiplier Impacts** – Multiplier impacts consist of indirect and induced impacts. Indirect impacts are related to the recirculation of monies spent locally by direct and related oil and gas establishments. For example, when an oil exploration and production company purchases services and products from firms providing support activities to the petroleum industry, this expenditure circulates through the local economy. Induced impacts are the impacts resulting from the recirculation of employee payroll within the economy. For example, as employees in the petroleum industry spend their salary for housing, food, and services, those expenditures also circulate through the economy resulting in increased spending, payroll, and employment throughout the Minot region. As this money is spent

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<sup>80</sup> The term “well-pad” refers to the practice of pad drilling, an activity that involves drilling multiple wellbores from a single surface location. Pad drilling is a relatively new practice in the petroleum industry, with wide implementation beginning in 2006. Before pad drilling, oil and gas exploration and production firms would drill a single well at a site, disassemble the drilling rig, move it to a new location, and then drill another well. Pad drilling has saved firms time and money by enabling them to drill 5, 10, 20, or more wells from a single, compact piece of land rather than repeatedly moving the rig and preparing a new drilling site. This practice also reduces the impact on the environment. For more information, see: <http://info.drillinginfo.com/launch-pad-rise-pad-drilling/>.

several times, it eventually leaks beyond the boundaries of the study area, and thus no longer benefits the region's citizens. The economic model uses parameters specific to the Minot region to estimate the leakage effect associated with petroleum industry activities.

- **Total Impacts** – Total impacts are the sum of all direct and multiplier (indirect and induced) economic activities attributable to direct and related oil and gas establishments.

Note that because multiplier impacts are not as easily quantified as direct impacts, a reliable method for estimating multiplier impacts must be applied. As such, the Impact Analysis for Planning (IMPLAN) model was used to quantify multiplier (indirect and induced) impacts. IMPLAN is an input-output model that estimates purchases and sales between various sectors of the economy, and is one of the leading methods available for estimating the total economic impact of an industry (in this case, the petroleum industry).

The IMPLAN model contains a large economic database that is used to generate input-output tables. IMPLAN multipliers and input-output tables specific to the Minot region's industrial sectors were obtained and used in this analysis. The model used for this analysis requires estimates for three separate components of the economy. These categories include the following:

- **Employment** – Employment is based on the total of full-time jobs plus part-time jobs. In this analysis, two part-time positions are the equivalent of a single full-time position.
- **Payroll** – Payroll represents the annual salary, wages, and benefits paid to all employees.
- **Economic Output (Spending)** – Output includes expenditures by direct and related oil and gas establishments for petroleum industry activities. Examples include exploration, extraction, production, and transportation of crude oil, natural gas, and natural gas liquids and the provision of engineering, surveying, and consulting services for well-pad development, operation, and maintenance. For direct oil and gas establishments, output also includes various revenue streams originating from both oil and gas exploration, such as lease bonuses, or oil and gas production, such as severance taxes and royalty payments.

It is important to note that payroll and economic output cannot be directly combined because some elements related to payroll are also contained in the output estimate. Each of the three impact components (employment, payroll, and economic output) stands alone as a measure of the petroleum industry's total economic impact in the Minot region.

## Data Requirements and Model Assumptions

Data related to petroleum industry activities in North Dakota was gathered for this analysis. This data served as inputs to the modeling process to identify total economic impacts. Data for the following categories of petroleum industry activities was required to estimate direct impacts:

- **Oil and Gas Drilling, Extraction, and Production** – Firms in this category are involved in the drilling, extraction, or production of crude oil, natural gas, or natural gas liquids. This includes services such as exploration (except geophysical surveying and mapping); excavating slush pits and cellars; well surveying; running, cutting, and pulling casings, tubes, and rods; cementing and shooting wells; perforating well casings; acidizing and chemically treating



wells; and cleaning out, bailing, and swabbing wells. All activities tied directly to well-pad operations are included in this category.<sup>81</sup>

- **Infrastructure Development** – This category includes establishments involved in providing necessary well-pad infrastructure including such activities as the development and construction of the well pad and surrounding site and any service roads to the well pad; pipeline development, use, and maintenance; power generation and distribution (e.g., power lines connecting the well pad to the power grid); gravel and scoria quarrying for service road construction; landfill operation (e.g., accepting of well-pad production waste); bulk petroleum storage; and supplying water for well-pad drilling and production. Excluded from this category are temporary and permanent residential housing construction, commercial or industrial construction not directly related to the well pad, and establishments involved in the supply or manufacture of well-pad materials.<sup>82</sup>
- **Professional Services** – Firms in this category provide services necessary for well-pad development, operation, and maintenance such as engineering services; consulting services; technical services; surveying; specialized repair services; testing laboratories; equipment leasing services; mineral rights services (landmen); and remediation services. Establishments engaged in administrative, management, scientific, and legal services specific to oil and gas development are also included in this category.<sup>83</sup>
- **Transportation** – These establishments transport supplies to the well pad in order to drill for oil and natural gas. This includes activities such as the transportation of oil, natural gas, production water, oilfield waste, and well-pad materials (e.g., supplies, chemicals, equipment, and machinery); transportation freight arrangement; hot shot services; and support activities for road and rail transportation including loading and unloading rail cars and operating independent terminals. Although establishments involved in support activities for rail transportation are included, railroad operators themselves are excluded. Establishments involved in the transportation of goods to retailers (gas stations, supermarkets, big box stores, etc.), the transportation of workers to and from worksites, and the transportation of agricultural products are also excluded.<sup>84</sup>
- **Wholesale Trade and Manufacturing** – Establishments in this category are involved in the supply or manufacture of materials that are unique, dedicated, and/or critical to well-pad construction, operation, or maintenance including materials such as electrical components; industrial equipment or machinery and related parts; storage tanks; concrete; proppants; and acids, chemicals, and other fluids. Excluded are firms whose wholesale supplies or manufactured items are not required for well-pad operations.<sup>85</sup>

<sup>81</sup> [https://www.ndworkforceintelligence.com/admin/gsipub/htmlarea/uploads/lmi\\_ogempreport2015.pdf](https://www.ndworkforceintelligence.com/admin/gsipub/htmlarea/uploads/lmi_ogempreport2015.pdf)

<sup>82</sup> Ibid.

<sup>83</sup> Ibid.

<sup>84</sup> Ibid.

<sup>85</sup> Ibid.

Direct economic impacts presented in this report were estimated based on data obtained from Job Service North Dakota's Labor Market Information Center. In 2013, The North Dakota Legislature directed Job Service North Dakota (JSND) to quantify employment and wages attributable to the state's oil and gas industry. Subsequently, JSND has issued the North Dakota Oil and Gas Employment Report for 2013, 2014 and 2015. Each annual report provides a detailed view of North Dakota's petroleum industry at state, county, and city levels using data collected via a special survey and supplemented with data from established sources. This economic impact analysis uses data from JSND's 2015 North Dakota Oil and Gas Employment Report, released in June 2016.

In JSND's 2015 North Dakota Oil and Gas Employment Report, total petroleum industry employment in 2015 is provided by county. For some counties, including Bottineau, Mountrail, Renville, and Ward in the Minot region, employment data is also provided for each category of petroleum industry activity considered in this economic impact analysis (i.e., oil and gas drilling, extraction and production; infrastructure development; professional services; transportation; and wholesale trade and manufacturing). The employment figures for these categories served as direct employment impacts for 2015 for Bottineau, Mountrail, Renville, and Ward counties. For counties where JSND's employment figures were not broken out, estimates of employment within each category of petroleum industry activities were made by applying percentages of those counties' 2015 total employment within North American Industry Classification System (NAICS) codes that corresponded to each category to the counties' total petroleum industry employment.<sup>86</sup>

Once the direct employment impacts for 2015 were estimated, growth rates were applied to estimate direct employment through 2024. The growth rates used in this analysis were obtained from the North Dakota Department of Mineral Resources - Oil and Gas Division's projections of oil and gas drilling, fracking, gathering, and production jobs in the state through 2050. These projections were presented at the North Dakota Petroleum Council's annual meeting in September 2016.<sup>87</sup> This analysis assumed that jobs in infrastructure development, professional services, transportation, and warehousing and manufacturing would grow at the same rates as drilling, fracking, gathering, and production jobs.

The results of this methodology are presented in **Table A-1**. As shown in the table, direct employment in the petroleum industry in the Minot region is projected to increase from nearly 7,700 employees in 2015 to approximately 17,400 employees in 2024 at an AAGR of 9.5 percent, based on the North Dakota Department of Mineral Resources – Oil and Gas Division's projections.

The direct employment impacts in **Table A-1** served as inputs to the IMPLAN model, which estimated direct payroll and output impacts as well as subsequent multiplier impacts.

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<sup>86</sup> Total employment in 2015 within NAICS codes for each county was obtained from the corresponding Area Profile published by JSND, available at: <https://www.ndworkforceintelligence.com/gsipub/index.asp?docid=350>.

<sup>87</sup> [http://www.ndoil.org/image/cache/Rob\\_Lindberg.pdf](http://www.ndoil.org/image/cache/Rob_Lindberg.pdf), Page 23

*Table A-1: Direct Employment Estimates of the Petroleum Industry Minot Region, 2015-2024*

Petroleum Industry Category	2015	2016	2017	2018	2019	2024	AAGR 2015- 2019	AAGR 2015- 2024
Oil and Gas Drilling, Extraction, & Production	3,166	3,448	3,900	4,579	5,314	7,179	13.8%	9.5%
Infrastructure Development	1,152	1,254	1,419	1,666	1,933	2,612	13.8%	9.5%
Professional Services	745	811	917	1,077	1,250	1,689	13.8%	9.5%
Transportation	1,806	1,968	2,226	2,613	3,032	4,097	13.8%	9.5%
Wholesale Trade & Manufacturing	796	867	980	1,151	1,335	1,804	13.8%	9.5%
<b>Total</b>	<b>7,664</b>	<b>8,348</b>	<b>9,443</b>	<b>11,085</b>	<b>12,864</b>	<b>17,380</b>	<b>13.8%</b>	<b>9.5%</b>

Source: CDM Smith

## Study Multipliers – Multiplier Impacts

Employment, payroll, and output impacts derived from firms engaged in the oil and gas drilling, extraction, and production; infrastructure development; professional services; transportation; and wholesale trade and manufacturing categories comprise direct economic impacts. As these impacts enter the economy, they circulate among other economic sectors, creating multiplier impacts of additional spending.

Multiplier impacts arise from various interdependencies within an economic system. For example, the operation of an oil and gas extraction firm requires inputs in the form of supplies, equipment, and maintenance. These inputs generate a boost in sales for those businesses providing these services and products. Moreover, the goods and services themselves require inputs for their production. The process continues as a large number of impacts recirculate through the economy. The total requirement for goods and services is the multiple of the initial needs of the petroleum industry-related establishments considered in this analysis; hence it is referred to using the term “multiplier.”

Multiplier impacts were derived from the IMPLAN model. The multipliers used in this study were developed specifically to measure the economic impacts that occur within different sectors of the Minot, North Dakota regional economy. **Table A-2** summarizes the multipliers used for modeling the impacts of the firms within the petroleum industry categories considered in this analysis. For example, \$100 in direct expenditures (output) in the professional services category supports a total output impact equivalent to \$156. In this example, the multiplier impacts would be \$56 (\$156 minus \$100). This methodology was applied to the direct impacts to generate estimates of total employment, annual payroll, and annual output for each petroleum industry category.

*Table A-2: Minot Region IMPLAN Multipliers by Petroleum Industry Category*

Petroleum Industry Category	Employment Multiplier	Payroll Multiplier	Output Multiplier
Oil and Gas Drilling, Extraction & Production	3.13	2.14	1.15
Infrastructure Development	1.90	1.42	1.40
Professional Services	1.79	1.60	1.56
Transportation	1.97	1.49	1.39
Wholesale Trade & Manufacturing	1.78	1.61	1.37

Source: CDM Smith and IMPLAN multipliers

## Employment, Payroll, and Output Impacts of the Petroleum Industry

The results of this analysis indicate that the petroleum industry is a significant generator of economic activity in the Minot region and is projected to produce an increase in economic impacts annually through 2024. The petroleum industry helps to support jobs, payroll, and output for the regional economy. The following sections present economic impacts associated with employment, annual payroll, and total annual output for the petroleum industry categories as measured by this analysis.

### Oil and Gas Drilling, Extraction, and Production

Direct, multiplier, and total impacts estimated for oil and gas drilling, extraction, and production activities for the period 2015 through 2024 are shown in **Table A-3**. The impacts are discussed by category below.

*Table A-3: Economic Impacts for Oil and Gas Drilling, Extraction & Production Activities*

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	3,166	3,448	3,900	4,579	5,314	7,179
Multiplier	6,733	7,332	8,294	9,738	11,301	15,267
<b>Total</b>	<b>9,899</b>	<b>10,780</b>	<b>12,194</b>	<b>14,317</b>	<b>16,615</b>	<b>22,446</b>
<b>PAYROLL</b>						
Direct	\$401,538,000	\$437,303,000	\$494,629,000	\$580,746,000	\$673,964,000	\$910,498,000
Multiplier	\$458,726,000	\$499,585,000	\$565,076,000	\$663,457,000	\$769,952,000	\$1,040,174,000
<b>Total</b>	<b>\$860,264,000</b>	<b>\$936,888,000</b>	<b>\$1,059,705,000</b>	<b>\$1,244,203,000</b>	<b>\$1,443,916,000</b>	<b>\$1,950,672,000</b>
<b>OUTPUT</b>						
Direct	\$7,916,244,000	\$8,621,354,000	\$9,751,532,000	\$11,449,298,000	\$13,287,088,000	\$17,950,318,000
Multiplier	\$1,150,576,000	\$1,253,059,000	\$1,417,323,000	\$1,664,083,000	\$1,931,194,000	\$2,608,965,000
<b>Total</b>	<b>\$9,066,820,000</b>	<b>\$9,874,413,000</b>	<b>\$11,168,855,000</b>	<b>\$13,113,381,000</b>	<b>\$15,218,282,000</b>	<b>\$20,559,283,000</b>

Source: CDM Smith and IMPLAN multipliers



## Direct Impacts

As shown in **Table A-3**, direct impacts supported by the oil and gas drilling, extraction, and production category in 2015 included nearly 3,200 jobs earning more than \$401.5 million in annual payroll, with an annual output of more than \$7.9 billion.<sup>88</sup> By 2024, these figures are projected to increase to nearly 7,200 direct jobs earning nearly \$910.5 million in annual payroll, with an annual output of nearly \$18.0 billion.

## Multiplier Impacts

Multiplier impacts are the employment, payroll, and output impacts created by ripple effects stemming from the direct impacts supported by oil and gas drilling, extraction, and production activities. As a result of these activities, additional multiplier employment is created in economic sectors such as limited- and full-service restaurants, hospitals, real estate, and maintenance and repair construction of non-residential structures. Multiplier impacts associated with oil and gas drilling, extraction, and production activities in 2015 accounted for more than 6,700 jobs in the Minot region; these employees received approximately \$458.7 million in annual payroll. Annual output was nearly \$1.2 billion. These impacts are estimated to increase to nearly 15,300 jobs, more than \$1.0 billion in annual payroll, and more than \$2.6 billion in annual output in 2024. These multiplier impacts are shown in **Table A-3**.

## Total Impacts

For 2015, the total annual output (including direct and multiplier impacts) supported by oil and gas drilling, extraction, and production activities in the Minot region was nearly \$9.1 billion. Total employment related to these activities was approximately 9,900 jobs, with a total annual payroll of nearly \$860.3 million. By 2024, these figures are estimated to reach more than 22,400 jobs earning nearly \$2.0 billion in annual payroll, with an annual output approaching \$20.6 billion.

## Infrastructure Development

**Table A-4** presents the direct, multiplier, and total impacts estimated for infrastructure development activities for the period 2015 through 2024. These impacts are discussed below.

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<sup>88</sup> Annual payroll in this analysis includes salary, wages, and benefits.

**Table A-4: Economic Impacts for Infrastructure Development Activities**

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	1,152	1,254	1,419	1,666	1,933	2,612
Multiplier	1,041	1,133	1,282	1,505	1,747	2,360
<b>Total</b>	<b>2,193</b>	<b>2,387</b>	<b>2,701</b>	<b>3,171</b>	<b>3,680</b>	<b>4,972</b>
<b>PAYROLL</b>						
Direct	\$122,530,000	\$133,379,000	\$150,929,000	\$177,190,000	\$205,589,000	\$277,815,000
Multiplier	\$52,029,000	\$56,636,000	\$64,088,000	\$75,239,000	\$87,298,000	\$117,966,000
<b>Total</b>	<b>\$174,559,000</b>	<b>\$190,015,000</b>	<b>\$215,017,000</b>	<b>\$252,429,000</b>	<b>\$292,887,000</b>	<b>\$395,781,000</b>
<b>OUTPUT</b>						
Direct	\$397,726,000	\$432,942,000	\$489,907,000	\$575,149,000	\$667,331,000	\$901,772,000
Multiplier	\$157,355,000	\$171,288,000	\$193,826,000	\$227,551,000	\$264,021,000	\$356,775,000
<b>Total</b>	<b>\$555,081,000</b>	<b>\$604,230,000</b>	<b>\$683,733,000</b>	<b>\$802,700,000</b>	<b>\$931,352,000</b>	<b>\$1,258,547,000</b>

Source: CDM Smith and IMPLAN multipliers

## Direct Impacts

In 2015, infrastructure development activities supported direct impacts of nearly 1,200 jobs in the region, more than \$122.5 million in annual payroll, and more than \$397.7 million in annual output. The impacts generated by these activities are projected to increase to approximately 2,600 direct jobs earning more than \$277.8 million in annual payroll in 2024. Annual output is estimated to increase to nearly \$901.8 million.

## Multiplier Impacts

Multiplier impacts generated by infrastructure development activities were estimated using IMPLAN multipliers. These impacts occur in economic sectors such as wholesale trade, full- and limited-service restaurants, hospitals, real estate, truck transportation, and retail stores. Multiplier impacts accounted for more than 1,000 jobs, approximately \$52.0 million in annual payroll, and nearly \$157.4 million in annual output in 2015, as presented in the table. By 2024, multiplier impacts are projected to account for nearly 2,400 jobs, nearly \$118.0 million in annual payroll, and nearly \$356.8 million in annual output.

## Total Impacts

When direct and multiplier impacts were combined, the total employment impact supported by infrastructure development activities was estimated at nearly 2,200 jobs earning a total annual payroll of nearly \$174.6 million in 2015. Total annual output was estimated at approximately \$555.0 million. In 2024, total employment supported by infrastructure development approaches 5,000 jobs earning nearly \$395.8 million in annual payroll. Total annual output is estimated at nearly \$1.3 billion.

## Professional Services

Direct, multiplier, and total impacts estimated for professional services activities for the period 2015 through 2024 are identified in **Table A-5** and are discussed below.

*Table A-5: Economic Impacts for Professional Services Activities*

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	745	811	917	1,077	1,250	1,689
Multiplier	590	642	726	853	990	1,338
<b>Total</b>	<b>1,335</b>	<b>1,453</b>	<b>1,643</b>	<b>1,930</b>	<b>2,240</b>	<b>3,027</b>
<b>PAYROLL</b>						
Direct	\$45,647,000	\$49,687,000	\$56,187,000	\$65,991,000	\$76,589,000	\$103,491,000
Multiplier	\$27,225,000	\$29,634,000	\$33,510,000	\$39,358,000	\$45,678,000	\$61,723,000
<b>Total</b>	<b>\$72,872,000</b>	<b>\$79,321,000</b>	<b>\$89,697,000</b>	<b>\$105,349,000</b>	<b>\$122,267,000</b>	<b>\$165,214,000</b>
<b>OUTPUT</b>						
Direct	\$146,567,000	\$159,537,000	\$180,407,000	\$211,887,000	\$245,916,000	\$332,295,000
Multiplier	\$82,594,000	\$89,902,000	\$101,663,000	\$119,403,000	\$138,579,000	\$187,255,000
<b>Total</b>	<b>\$229,161,000</b>	<b>\$249,439,000</b>	<b>\$282,070,000</b>	<b>\$331,290,000</b>	<b>\$384,495,000</b>	<b>\$519,550,000</b>

Source: CDM Smith and IMPLAN multipliers

### Direct Impacts

As presented in **Table A-5**, direct impacts generated by professional services activities include more than 700 jobs earning more than \$45.6 million in annual payroll, with an annual output approaching \$146.6 million in 2015. These impacts are estimated to increase to nearly 1,700 direct jobs earning nearly \$103.5 million in annual payroll, with an annual output of nearly \$332.3 million by 2024.

### Multiplier Impacts

Multiplier impacts generated by professional services activities are produced within economic sectors such as real estate, full- and limited-service restaurants, hospitals, retail stores, wholesale trade, and employment services. In 2015, multiplier impacts accounted for nearly 600 jobs earning more than \$27.2 million in annual payroll and supported nearly \$82.6 million in annual output. Multiplier impacts are projected to grow to more than 1,300 jobs, more than \$61.7 million in annual payroll, and nearly \$187.3 million in annual output by 2024.

### Total Impacts

The total annual output (including direct and multiplier impacts) supported by professional services activities occurring within the petroleum industry was nearly \$229.2 million in 2015, as identified in **Table A-5**. Total employment supported by these activities exceeded 1,300 jobs, with a total annual payroll approaching \$72.9 million. By 2024, these impacts are projected to increase to nearly \$520.0 million in annual output and more than 3,000 jobs earning more than \$165.2 million in annual salary, wages, and benefits.

## Transportation

The direct, multiplier, and total economic impacts estimated for transportation activities occurring within the petroleum industry in the Minot region are shown in **Table A-6**.

*Table A-6: Economic Impacts for Transportation Activities*

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	1,806	1,968	2,226	2,613	3,032	4,097
Multiplier	1,744	1,900	2,149	2,523	2,928	3,956
<b>Total</b>	<b>3,550</b>	<b>3,868</b>	<b>4,375</b>	<b>5,136</b>	<b>5,960</b>	<b>8,053</b>
<b>PAYROLL</b>						
Direct	\$186,867,000	\$203,629,000	\$230,325,000	\$270,368,000	\$313,722,000	\$423,917,000
Multiplier	\$91,083,000	\$99,254,000	\$112,266,000	\$131,783,000	\$152,915,000	\$206,627,000
<b>Total</b>	<b>\$277,950,000</b>	<b>\$302,883,000</b>	<b>\$342,591,000</b>	<b>\$402,151,000</b>	<b>\$466,637,000</b>	<b>\$630,544,000</b>
<b>OUTPUT</b>						
Direct	\$687,681,000	\$749,367,000	\$847,607,000	\$994,968,000	\$1,154,513,000	\$1,560,039,000
Multiplier	\$270,708,000	\$294,991,000	\$333,663,000	\$391,672,000	\$454,477,000	\$614,114,000
<b>Total</b>	<b>\$958,389,000</b>	<b>\$1,044,358,000</b>	<b>\$1,181,270,000</b>	<b>\$1,386,640,000</b>	<b>\$1,608,990,000</b>	<b>\$2,174,153,000</b>

Source: CDM Smith and IMPLAN multipliers

### Direct Impacts

In 2015, transportation activities occurring within the petroleum industry supported approximately 1,800 direct jobs earning nearly \$186.9 million in annual payroll. Direct annual output approached \$687.7 million. These direct impacts are estimated to grow to nearly 4,100 direct jobs, nearly \$424.0 million in annual salary, wages, and benefits, and nearly \$1.6 billion in annual output in.

### Multiplier Impacts

The direct impacts supported by transportation activities create ripple effects, which produce multiplier impacts within the Minot region's economy. Examples of economic sectors where these multiplier impacts are generated include wholesale trade, real estate, retail stores, full- and limited-service restaurants, hospitals, financial investment activities, and maintenance and repair construction of non-residential structures. In 2015, multiplier impacts resulted in more than 1,700 additional jobs having an annual payroll of approximately \$91.0 million. Annual output exceeded \$270.7 million. By 2024, this analysis estimates that multiplier impacts will increase to almost 4,000 jobs, more than \$206.6 million in annual payroll, and more than \$614.1 million in annual output.

### Total Impacts

For 2015, the total annual output supported by transportation activities in the Minot region approached \$958.4 million, which includes direct and multiplier impacts. These expenditures helped to support a total of nearly 3,600 jobs having an annual payroll of approximately \$278.0 million.



These figures are projected to reach more than 8,000 jobs earning more than \$630.5 million in annual payroll, with an annual output approaching \$2.2 billion by 2024.

## Wholesale Trade and Manufacturing

**Table A-7** presents the economic impacts supported by wholesale trade and manufacturing activities related to the petroleum industry.

*Table A-7: Economic Impacts for Wholesale Trade and Manufacturing Activities*

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	796	867	980	1,151	1,335	1,804
Multiplier	624	680	768	902	1,046	1,414
<b>Total</b>	<b>1,420</b>	<b>1,547</b>	<b>1,748</b>	<b>2,053</b>	<b>2,381</b>	<b>3,218</b>
<b>PAYROLL</b>						
Direct	\$53,426,000	\$58,193,000	\$65,774,000	\$77,252,000	\$89,606,000	\$121,085,000
Multiplier	\$32,535,000	\$35,438,000	\$40,055,000	\$47,045,000	\$54,568,000	\$73,738,000
<b>Total</b>	<b>\$85,961,000</b>	<b>\$93,631,000</b>	<b>\$105,829,000</b>	<b>\$124,297,000</b>	<b>\$144,174,000</b>	<b>\$194,823,000</b>
<b>OUTPUT</b>						
Direct	\$256,568,000	\$279,457,000	\$315,865,000	\$370,985,000	\$430,311,000	\$581,484,000
Multiplier	\$96,045,000	\$104,613,000	\$118,242,000	\$138,876,000	\$161,084,000	\$217,675,000
<b>Total</b>	<b>\$352,613,000</b>	<b>\$384,070,000</b>	<b>\$434,107,000</b>	<b>\$509,861,000</b>	<b>\$591,395,000</b>	<b>\$799,159,000</b>

Source: CDM Smith and IMPLAN multipliers

### Direct Impacts

Direct impacts generated by wholesale trade and manufacturing activities included nearly 800 jobs earning more than \$53.4 million in annual payroll, with an annual output approaching \$256.6 million in 2015. By 2024, these impacts are estimated to increase to approximately 1,800 direct jobs earning nearly \$121.1 million in annual payroll, with an annual output of nearly \$581.5 million by 2024.

### Multiplier Impacts

Recirculation of the direct impacts generated by wholesale trade and manufacturing activities creates multiplier impacts in the Minot region's economy, which were estimated using IMPLAN multipliers. These impacts occur in economic sectors such as hospitals, full- and limited-service restaurants, real estate, truck transportation, retail stores, business support services, and monetary authorities and depository credit intermediation. This analysis estimated that these impacts included more than 600 additional employees, more than \$32.5 million in annual payroll, and approximately \$96.0 million in annual output. Multiplier impacts are projected to climb to more than 1,400 employees earning more than \$73.7 million in annual salary, wages, and benefits by 2024. Annual output is estimated to reach nearly \$217.7 million.

## Total Impacts

In 2015, total impacts (direct and multiplier impacts) generated by wholesale trade and manufacturing activities occurring within the petroleum industry in the Minot region included more than 1,400 jobs, nearly \$86.0 million in annual payroll, and more than \$352.6 million in annual output, as presented in **Table A-7**. These impacts are estimated to grow to more than 3,200 jobs, more than \$194.8 million in annual payroll, and nearly \$800.0 million in annual output by 2024.

## Total Economic Impacts of the Petroleum Industry in the Minot Region

**Table A-8** combines the economic impacts shown in Tables 5-6 through 5-10 to summarize the total economic impacts of the petroleum industry in the Minot region for the period 2015 through 2024. As presented in Table 5-13, when all 2015 total employment, total annual payroll, and total annual output impacts for the petroleum industry activities considered in this analysis are summed, the petroleum industry:

- supported nearly 18,400 jobs (direct and multiplier)
- generated nearly \$1.5 billion in annual payroll (direct and multiplier)
- produced nearly \$11.2 billion in annual output (direct and multiplier)
- In 2024, the petroleum industry is estimated to:
- support more than 41,700 jobs (direct and multiplier)
- generate more than \$3.3 billion in annual payroll (direct and multiplier)
- produce more than \$25.3 billion in annual output (direct and multiplier)

*Table A-8: Total Economic Impacts of the Petroleum Industry*

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	7,665	8,348	9,442	11,086	12,864	17,381
Multiplier	10,732	11,687	13,219	15,521	18,012	24,335
<b>Total</b>	<b>18,397</b>	<b>20,035</b>	<b>22,661</b>	<b>26,607</b>	<b>30,876</b>	<b>41,716</b>
<b>PAYROLL</b>						
Direct	\$810,008,000	\$882,191,000	\$997,844,000	\$1,171,547,000	\$1,359,470,000	\$1,836,806,000
Multiplier	\$661,598,000	\$720,547,000	\$814,995,000	\$956,882,000	\$1,110,411,000	\$1,500,228,000
<b>Total</b>	<b>\$1,471,606,000</b>	<b>\$1,602,738,000</b>	<b>\$1,812,839,000</b>	<b>\$2,128,429,000</b>	<b>\$2,469,881,000</b>	<b>\$3,337,034,000</b>
<b>OUTPUT</b>						
Direct	\$9,404,786,000	\$10,242,657,000	\$11,585,318,000	\$13,602,287,000	\$15,785,159,000	\$21,325,908,000
Multiplier	\$1,757,278,000	\$1,913,853,000	\$2,164,717,000	\$2,541,585,000	\$2,949,355,000	\$3,984,784,000
<b>Total</b>	<b>\$11,162,064,000</b>	<b>\$12,156,510,000</b>	<b>\$13,750,035,000</b>	<b>\$16,143,872,000</b>	<b>\$18,734,514,000</b>	<b>\$25,310,692,000</b>

Source: CDM Smith and IMPLAN multipliers

## Employment, Payroll, and Output Impacts of the Petroleum Industry's Non-Resident Workforce

As previously explained, a large number of employees in North Dakota's petroleum industry work in the state but live elsewhere. This is due to the unique nature of the oil and gas industry. For example, workers involved in oil and gas industry activities such as drilling, hydraulic fracturing (fracking), and infrastructure construction typically have alternating working and non-working periods. During the non-working periods, workers who are not residents of North Dakota will return to their permanent residence out of state. Because the objective of this analysis is to assess the petroleum industry's potential impact on the Minot region's future population, it was necessary to estimate the portion of economic impacts in Table 5-13 that can be attributed to non-resident workers, who are not included in the preferred population projections for the Minot region and the City of Minot.

A May 2016 research report prepared by NDSU's Department of Agribusiness and Applied Economics provides insight on the residency of North Dakota's oil and gas industry workforce. In their report *Assessment of the Oil and Gas Industry Workforce*, the study authors, Nancy Hodur and Dean Bangsund, sought to describe the current petroleum industry workforce in western North Dakota in terms of residency, job description, and industry activity. As part of their data collection effort, Hodur and Bangsund surveyed petroleum industry firms involved in activities similar to the categories of firms included in this analysis to identify workforce residency. They found that 60 percent of the workers at the surveyed firms were residents of North Dakota and 40 percent lived in neighboring states or elsewhere in the United States.

Based on these findings, this analysis estimated that 40 percent of the economic impacts in Table 5-13 can be attributed to non-resident workers. A breakout of these impacts produced by non-resident workers is provided in **Table A-9**. As shown in the table, the non-resident workforce in the petroleum industry in the Minot region in 2015:

- supported nearly 7,400 total (direct and multiplier) jobs
- generated more than \$588.6 million in total (direct and multiplier) annual payroll
- produced nearly \$4.5 billion in total (direct and multiplier) annual output

In 2024, the non-resident workforce in the petroleum industry is projected to:

- support nearly 16,700 total (direct and multiplier) jobs
- generate more than \$1.3 billion in total (direct and multiplier) annual payroll
- produce more than \$10.1 billion in total (direct and multiplier) annual output

**Table A-9: Total Economic Impacts of the Non-Resident Workforce in the Petroleum Industry**

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>EMPLOYMENT</b>						
Direct	3,066	3,339	3,777	4,434	5,146	6,952
Multiplier	4,293	4,675	5,288	6,208	7,205	9,734
<b>Total</b>	<b>7,359</b>	<b>8,014</b>	<b>9,065</b>	<b>10,642</b>	<b>12,351</b>	<b>16,686</b>
<b>PAYROLL</b>						
Direct	\$324,003,000	\$352,876,000	\$399,138,000	\$468,619,000	\$543,788,000	\$734,722,000
Multiplier	\$264,639,000	\$288,219,000	\$325,998,000	\$382,753,000	\$444,164,000	\$600,091,000
<b>Total</b>	<b>\$588,642,000</b>	<b>\$641,095,000</b>	<b>\$725,136,000</b>	<b>\$851,372,000</b>	<b>\$987,952,000</b>	<b>\$1,334,813,000</b>
<b>OUTPUT</b>						
Direct	\$3,761,914,000	\$4,097,063,000	\$4,634,127,000	\$5,440,915,000	\$6,314,064,000	\$8,530,363,000
Multiplier	\$702,911,000	\$765,541,000	\$865,887,000	\$1,016,634,000	\$1,179,742,000	\$1,593,914,000
<b>Total</b>	<b>\$4,464,825,000</b>	<b>\$4,862,604,000</b>	<b>\$5,500,014,000</b>	<b>\$6,457,549,000</b>	<b>\$7,493,806,000</b>	<b>\$10,124,277,000</b>

Source: CDM Smith and IMPLAN multipliers

To estimate the economic impacts attributed to the non-resident workforce in the City of Minot, it was first necessary to estimate the economic impacts generated by non-resident workers in Ward County, where the City of Minot is located. According to data available from JSND's 2015 North Dakota Oil and Gas Employment Report, 46.5 percent of the petroleum industry workers in the Minot region worked in Ward County in 2015. This percentage was applied to the economic impacts for the Minot region in Table 5-14, which yielded the non-resident workforce economic impacts for Ward County in **Table A-10**. The table shows that in 2015 the non-resident workforce in the petroleum industry in Ward County:

- supported more than 3,400 total (direct and multiplier) jobs
- generated more than \$273.5 million in total (direct and multiplier) annual payroll
- produced nearly \$2.1 billion in total (direct and multiplier) annual output

In 2024, the non-resident workforce in the petroleum industry is projected to:

- support nearly 7,800 total (direct and multiplier) jobs
- generate \$620.3 million in total (direct and multiplier) annual payroll
- produce more than \$4.7 billion in total (direct and multiplier) annual output

JSND's 2015 North Dakota Oil and Gas Employment Report also shows that in 2015, 83.5 percent of the petroleum industry workforce in Ward County worked in the City of Minot. This percentage was applied to the economic impacts for Ward County in Table 5-15 to identify the economic impacts attributed to non-resident workers in the City of Minot. These impacts are presented in **Table A-11**, which reveals that in 2015 the non-resident workforce in the oil and gas industry in the City of Minot:



**Table A-10: Total Economic Impacts of the Non-Resident Workforce in the Petroleum Industry**

Ward County, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>Employment</b>						
Direct	1,425	1,552	1,755	2,061	2,391	3,231
Multiplier	1,995	2,173	2,457	2,885	3,348	4,523
<b>Total</b>	<b>3,420</b>	<b>3,725</b>	<b>4,212</b>	<b>4,946</b>	<b>5,739</b>	<b>7,754</b>
<b>Payroll</b>						
Direct	\$150,567,000	\$163,985,000	\$185,483,000	\$217,772,000	\$252,704,000	\$341,432,000
Multiplier	\$122,980,000	\$133,938,000	\$151,494,000	\$177,869,000	\$206,407,000	\$278,868,000
<b>Total</b>	<b>\$273,547,000</b>	<b>\$297,923,000</b>	<b>\$336,977,000</b>	<b>\$395,641,000</b>	<b>\$459,111,000</b>	<b>\$620,300,000</b>
<b>Output</b>						
Direct	\$1,748,198,000	\$1,903,945,000	\$2,153,524,000	\$2,528,446,000	\$2,934,207,000	\$3,964,143,000
Multiplier	\$326,650,000	\$355,754,000	\$402,386,000	\$472,440,000	\$548,238,000	\$740,707,000
<b>Total</b>	<b>\$2,074,848,000</b>	<b>\$2,259,699,000</b>	<b>\$2,555,910,000</b>	<b>\$3,000,886,000</b>	<b>\$3,482,445,000</b>	<b>\$4,704,850,000</b>

Source: CDM Smith and IMPLAN multipliers

**Table A-11: Total Economic Impacts of the Non-Resident Workforce in the Petroleum Industry**

City of Minot, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>Employment</b>						
Direct	1,189	1,295	1,465	1,720	1,996	2,697
Multiplier	1,665	1,814	2,051	2,408	2,794	3,775
<b>Total</b>	<b>2,854</b>	<b>3,109</b>	<b>3,516</b>	<b>4,128</b>	<b>4,790</b>	<b>6,472</b>
<b>Payroll</b>						
Direct	\$125,670,000	\$136,869,000	\$154,812,000	\$181,762,000	\$210,918,000	\$284,974,000
Multiplier	\$102,644,000	\$111,790,000	\$126,443,000	\$148,457,000	\$172,276,000	\$232,755,000
<b>Total</b>	<b>\$228,314,000</b>	<b>\$248,659,000</b>	<b>\$281,255,000</b>	<b>\$330,219,000</b>	<b>\$383,194,000</b>	<b>\$517,729,000</b>
<b>Output</b>						
Direct	\$1,459,122,000	\$1,589,115,000	\$1,797,425,000	\$2,110,351,000	\$2,449,017,000	\$3,308,646,000
Multiplier	\$272,636,000	\$296,928,000	\$335,849,000	\$394,319,000	\$457,583,000	\$618,226,000
<b>Total</b>	<b>\$1,731,758,000</b>	<b>\$1,886,043,000</b>	<b>\$2,133,274,000</b>	<b>\$2,504,670,000</b>	<b>\$2,906,600,000</b>	<b>\$3,926,872,000</b>

Source: CDM Smith and IMPLAN multipliers

- supported nearly 2,900 total (direct and multiplier) jobs
- generated more than \$228.3 million in total (direct and multiplier) annual payroll
- produced more than \$1.7 billion in total (direct and multiplier) annual output

In 2024, the non-resident workforce in the petroleum industry is projected to:

- support nearly 6,500 total (direct and multiplier) jobs
- generate more than \$517.7 million in total (direct and multiplier) annual payroll
- produce more than \$3.9 billion in total (direct and multiplier) annual output

## Preferred Population Projections with Non-Resident Workers Included

To assess the petroleum industry's potential impact on the future population of the Minot region and the City of Minot, the direct and multiplier employment impacts identified in Tables 5-14 and 5-16 were added to the preferred population projections for the Minot region and the City of Minot for the 2015 to 2024 period, since non-resident workers (and therefore any associated multiplier impacts) were omitted from those forecasts. **Table A-12** presents the results of adding the non-resident workers and associated multiplier jobs from **Table A-10** and **Table A-11** to the preferred population projections. As shown in **Table A-12**, when non-resident worker population impacts are included, the Minot region's population is projected to increase at an AAGR of 2.3 percent from 2015 to 2024 (compared to 1.5 percent when those impacts are excluded). The non-resident workers and associated multiplier jobs add nearly 7,400 people to the Minot region's population in 2015 and nearly 16,700 people by 2024. In the case of the City of Minot, adding the non-resident worker population impacts results in the AAGR for the City's population to increase from 1.5 percent to 2.1 percent during the 2015 to 2024 period. Non-resident workers and multiplier jobs add nearly 2,900 people to the City's population in 2015 and nearly 6,500 people by 2024.

*Table A-12: Preferred Population Projections with Non-Resident Petroleum Industry Workers and Associated Multiplier Jobs Included*

Minot Region and the City of Minot, 2015-2024

	2015	2016	2017	2018	2019	2024	AAGR 2015- 2019	AAGR 2015- 2024
<b>MINOT REGION</b>								
Non-Resident Workers Excluded	103,380	105,775	108,225	110,731	113,296	118,606	2.3%	1.5%
Non-Resident Workers Included	110,739	113,789	117,290	121,373	125,647	135,292	3.2%	2.3%
Population Difference	7,359	8,014	9,065	10,642	12,351	16,686	13.8%	9.5%
<b>CITY OF MINOT</b>								
Non-Resident Workers Excluded	49,080	50,186	51,316	52,472	53,654	56,306	2.3%	1.5%
Non-Resident Workers Included	51,934	53,295	54,832	56,600	58,444	62,778	3.0%	2.1%
Population Difference	2,854	3,109	3,516	4,128	4,790	6,472	13.8%	9.5%

Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University; CDM Smith

What is important to realize is the non-resident petroleum industry workers added to the population projections in **Table A-12** will require public and private goods and services, such as housing, access to health care, police and fire protection, access to schools, and retail and entertainment options, even though they do not call North Dakota their permanent home. The multiplier jobs generated by the non-resident petroleum industry workers will likewise require these same goods and services.

## Summary

North Dakota's oil and gas industry has experienced tremendous growth within the last ten years. This growth has brought a population surge as people have flocked to the state to take advantage of the employment opportunities created within this industry. The onslaught of new residents has strained public resources in communities in the state's western counties, and those communities have found it difficult to plan for the provision of future goods and services due to the volatility of oil prices and the unique nature of oil and gas industry workforce. Although the price of oil has dropped significantly since late 2014, which has resulted in a substantial slowdown in the state's petroleum industry, the North Dakota Department of Mineral Resources – Oil and Gas Division projects significant employment growth within the industry in the future.

This analysis estimated the economic impacts of the petroleum industry in the Minot region for the period 2015 to 2024 to assist public policy makers and economic developers as they plan for the future. Because recent population forecasts prepared for North Dakota did not include non-resident workers in the projections, this analysis provided a breakout of the economic impacts of the petroleum industry that are attributed to that industry's non-resident workers so those workers and associated multiplier jobs could be added to the preferred population projections selected for this analysis. This allows a clearer picture of the population that will require goods and services such as housing, access to health care, police and fire protection, access to schools, and retail and entertainment options.

**Table A-13** summarizes the estimated economic impacts of the petroleum industry in the Minot region and the portion of those impacts that are generated by the industry's non-resident workers. As shown in Table 5-18, the petroleum industry accounted for the following total (direct and multiplier) economic impacts in 2015:

- Jobs – 18,397
- Annual Payroll – \$1,471,606,000
- Annual Output – \$11,162,064,000

Of these total impacts, it is estimated that non-resident oil and gas workers and associated multiplier jobs were responsible for:

- Jobs – 7,359
- Annual Payroll – \$588,642,000
- Annual Output – \$4,464,825,000

**Table A-13: Economic Impacts of the Petroleum Industry and Non-Resident Workforce**

Minot Region, 2015-2024

	2015	2016	2017	2018	2019	2024
<b>TOTAL PETROLEUM INDUSTRY</b>						
<b>EMPLOYMENT</b>						
Direct	7,665	8,348	9,442	11,086	12,864	17,381
Multiplier	10,732	11,687	13,219	15,521	18,012	24,335
<b>Total</b>	<b>18,397</b>	<b>20,035</b>	<b>22,661</b>	<b>26,607</b>	<b>30,876</b>	<b>41,716</b>
<b>PAYROLL</b>						
Direct	\$810,008,000	\$882,191,000	\$997,844,000	\$1,171,547,000	\$1,359,470,000	\$1,836,806,000
Multiplier	\$661,598,000	\$720,547,000	\$814,995,000	\$956,882,000	\$1,110,411,000	\$1,500,228,000
<b>Total</b>	<b>\$1,471,606,000</b>	<b>\$1,602,738,000</b>	<b>\$1,812,839,000</b>	<b>\$2,128,429,000</b>	<b>\$2,469,881,000</b>	<b>\$3,337,034,000</b>
<b>OUTPUT</b>						
Direct	\$9,404,786,000	\$10,242,657,000	\$11,585,318,000	\$13,602,287,000	\$15,785,159,000	\$21,325,908,000
Multiplier	\$1,757,278,000	\$1,913,853,000	\$2,164,717,000	\$2,541,585,000	\$2,949,355,000	\$3,984,784,000
<b>Total</b>	<b>\$11,162,064,000</b>	<b>\$12,156,510,000</b>	<b>\$13,750,035,000</b>	<b>\$16,143,872,000</b>	<b>\$18,734,514,000</b>	<b>\$25,310,692,000</b>
<b>NON-RESIDENT WORKFORCE</b>						
<b>EMPLOYMENT</b>						
Direct	3,066	3,339	3,777	4,434	5,146	6,952
Multiplier	4,293	4,675	5,288	6,208	7,205	9,734
<b>Total</b>	<b>7,359</b>	<b>8,014</b>	<b>9,065</b>	<b>10,642</b>	<b>12,351</b>	<b>16,686</b>
<b>PAYROLL</b>						
Direct	\$324,003,000	\$352,876,000	\$399,138,000	\$468,619,000	\$543,788,000	\$734,722,000
Multiplier	\$264,639,000	\$288,219,000	\$325,998,000	\$382,753,000	\$444,164,000	\$600,091,000
<b>Total</b>	<b>\$588,642,000</b>	<b>\$641,095,000</b>	<b>\$725,136,000</b>	<b>\$851,372,000</b>	<b>\$987,952,000</b>	<b>\$1,334,813,000</b>
<b>OUTPUT</b>						
Direct	\$3,761,914,000	\$4,097,063,000	\$4,634,127,000	\$5,440,915,000	\$6,314,064,000	\$8,530,363,000
Multiplier	\$702,911,000	\$765,541,000	\$865,887,000	\$1,016,634,000	\$1,179,742,000	\$1,593,914,000
<b>Total</b>	<b>\$4,464,825,000</b>	<b>\$4,862,604,000</b>	<b>\$5,500,014,000</b>	<b>\$6,457,549,000</b>	<b>\$7,493,806,000</b>	<b>\$10,124,277,000</b>

Source: CDM Smith and IMPLAN multipliers

In 2024, the total (direct and multiplier) economic impacts of the petroleum industry in the Minot region are projected to grow to:

- Jobs – 41,716
- Annual Payroll – \$3,337,034,000
- Annual Output – \$25,310,692,000

Of these total economic impacts, non-resident workers and associated multiplier jobs account for:

- Jobs – 16,686
- Annual Payroll – \$1,334,813,000
- Annual Output – \$10,124,277,000



**Table A-14** presents the preferred population projections for the Minot region and the City of Minot with the total jobs attributed to non-resident workers and associated multiplier jobs from Table 5-18 included. As shown in the table, when non-resident workers and multiplier jobs are included in the NDSU's population forecast for the Minot region, the region's population could grow from approximately 103,400 people in 2015 to nearly 135,300 people by 2024. This growth represents an AAGR of 2.3 percent. When the non-resident workforce impacts are included in NDSU's population projection for the City of Minot, the City's population could grow from approximately 51,900 people in 2015 to nearly 62,800 people by 2024, representing an AAGR of 2.1 percent. In the case of the Minot region, the non-resident workers and associated multiplier jobs could add nearly 7,400 people to the region's population in 2015 and nearly 16,700 people in 2024. For the City of Minot, the non-resident workforce impacts could add nearly 3,000 people to the City's population in 2015 and nearly 6,500 people by 2024. It is important to note that all of these non-resident workers and associated multiplier jobs in the Minot region and the City of Minot require access to housing and other goods and services.

*Table A-14: Population Forecasts for the Minot Region and the City of Minot with Non-Resident Petroleum Industry Workers and Associated Multiplier Jobs Included, 2015-2024*

	2015	2016	2017	2018	2019	2024	AAGR 2015- 2019	AAGR 2015- 2024
<b>MINOT REGION</b>								
Non-Resident Workers Excluded	103,380	105,775	108,225	110,731	113,296	118,606	2.3%	1.5%
Non-Resident Workers Included	110,739	113,789	117,290	121,373	125,647	135,292	3.2%	2.3%
Population Difference	7,359	8,014	9,065	10,642	12,351	16,686	13.8%	9.5%
<b>CITY OF MINOT</b>								
Non-Resident Workers Excluded	49,080	50,186	51,316	52,472	53,654	56,306	2.3%	1.5%
Non-Resident Workers Included	51,934	53,295	54,832	56,600	58,444	62,778	3.0%	2.1%
Population Difference	2,854	3,109	3,516	4,128	4,790	6,472	13.8%	9.5%

Source: 2016 North Dakota Statewide Housing Needs Assessment, prepared by the Center for Social Research and the Department of Agribusiness and Applied Economics at North Dakota State University, and CDM Smith

